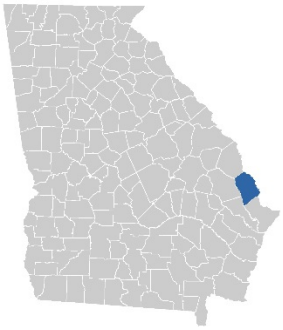
FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1



EFFINGHAM COUNTY, GEORGIA

AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
EFFINGHAM COUNTY, UNINCORPORATED AREAS	130076
GUYTON, CITY OF	130456
RINCON, CITY OF	130426
SPRINGFIELD, CITY OF	130427

PRELIMINARY
11/16/2015

FEMA

EFFECTIVE:

FLOOD INSURANCE STUDY NUMBER
13103CV000C

Version Number 2.3.2.1

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Volume 1

Exhibits

Flood Profiles	Panel
Black Creek	01 P
Dasher Creek	02-05 P
Horning Swamp	06 P
Jacks Branch	07-09 P
Little Ogeechee River	10-14 P
Little Ogeechee River Convergence	15 P
Little Ogeechee River Divergence	16 P
Little Ogeechee River Tributary 1	17-19 P
Ogeechee River	20-23 P
Polly Creek	24-25 P
Rincon Branch	26 P
Runs Branch	27-28 P
Snooks Branch	29 P
St. Augustine Creek	30-31 P
Sweigoffer Creek	32-33 P
Unnamed Tributary to Black Creek	34 P
White Deer Branch	35 P
Willowpeg Creek	36 P

Published Separately

Flood Insurance Rate Map (FIRM)

FLOOD INSURANCE STUDY REPORT
EFFINGHAM COUNTY, GEORGIA

SECTION 1.0 – INTRODUCTION

1.1 The National Flood Insurance Program

The National Flood Insurance Program (NFIP) is a voluntary Federal program that enables property owners in participating communities to purchase insurance protection against losses from flooding. This insurance is designed to provide an alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods.

For decades, the national response to flood disasters was generally limited to constructing flood-control works such as dams, levees, sea-walls, and the like, and providing disaster relief to flood victims. This approach did not reduce losses nor did it discourage unwise development. In some instances, it may have actually encouraged additional development. To compound the problem, the public generally could not buy flood coverage from insurance companies, and building techniques to reduce flood damage were often overlooked.

In the face of mounting flood losses and escalating costs of disaster relief to the general taxpayers, the U.S. Congress created the NFIP. The intent was to reduce future flood damage through community floodplain management ordinances, and provide protection for property owners against potential losses through an insurance mechanism that requires a premium to be paid for the protection.

The U.S. Congress established the NFIP on August 1, 1968, with the passage of the National Flood Insurance Act of 1968. The NFIP was broadened and modified with the passage of the Flood Disaster Protection Act of 1973 and other legislative measures. It was further modified by the National Flood Insurance Reform Act of 1994 and the Flood Insurance Reform Act of 2004. The NFIP is administered by the Federal Emergency Management Agency (FEMA), which is a component of the Department of Homeland Security (DHS).

Participation in the NFIP is based on an agreement between local communities and the Federal Government. If a community adopts and enforces floodplain management regulations to reduce future flood risks to new construction and substantially improved structures in Special Flood Hazard Areas (SFHAs), the Federal Government will make flood insurance available within the community as a financial protection against flood losses. The community's floodplain management regulations must meet or exceed criteria established in accordance with Title 44 Code of Federal Regulations (CFR) Part 60.3, *Criteria for Land Management and Use*.

SFHAs are delineated on the community's Flood Insurance Rate Maps (FIRMs). Under the NFIP, buildings that were built before the flood hazard was identified on the community's FIRMs are generally referred to as "Pre-FIRM" buildings. When the NFIP was created, the U.S. Congress recognized that insurance for Pre-FIRM buildings would be prohibitively expensive if the premiums were not subsidized by the Federal Government. Congress also recognized that most of these floodprone buildings were built by individuals who did not have sufficient knowledge of the flood hazard to make informed decisions. The NFIP requires that full actuarial rates reflecting the complete flood risk be charged on all buildings constructed or substantially improved on or after

the effective date of the initial FIRM for the community or after December 31, 1974, whichever is later. These buildings are generally referred to as "Post-FIRM" buildings.

1.2 Purpose of this Flood Insurance Study Report

This Flood Insurance Study (FIS) Report revises and updates information on the existence and severity of flood hazards for the study area. The studies described in this report developed flood hazard data that will be used to establish actuarial flood insurance rates and to assist communities in efforts to implement sound floodplain management.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive than the minimum Federal requirements. Contact your State NFIP Coordinator to ensure that any higher State standards are included in the community's regulations.

1.3 Jurisdictions Included in the Flood Insurance Study Project

This FIS Report covers the entire geographic area of Effingham County, Georgia.

The jurisdictions that are included in this project area, along with the Community Identification Number (CID) for each community and the 8-digit Hydrologic Unit Codes (HUC-8) sub-basins affecting each, are shown in Table 1. The Flood Insurance Rate Map (FIRM) panel numbers that affect each community are listed. If the flood hazard data for the community is not included in this FIS Report, the location of that data is identified.

The location of flood hazard data for participating communities in multiple jurisdictions is also indicated in the table.

Table 1: Listing of NFIP Jurisdictions

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Effingham County, Unincorporated Areas	130076	03060109 03060202 03060204	13103C0025E 13103C0050E 13103C0075E 13103C0090E 13103C0125E 13103C0150E 13103C0163E 13103C0164E 13103C0168E 13103C0175E 13103C0200F 13103C0210E 13103C0235E 13103C0245E 13103C0250E 13103C0251F 13103C0252E 13103C0253F[1] 13103C0256E 13103C0257E 13103C0258E 13103C0259E 13103C0265E 13103C0267E 13103C0269E 13103C0270E 13103C0278E 13103C0279E 13103C0280E 13103C0286E 13103C0287F 13103C0288E 13103C0289E 13103C0300F 13103C0315F 13103C0330E 13103C0331E 13103C0332E 13103C0333E 13103C0334E 13103C0341E 13103C0342E 13103C0343E 13103C0344E 13103C0351E 13103C0353E 13103C0355E 13103C0360E 13103C0361E	

Table 1: Listing of NFIP Jurisdictions - continued

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
Effingham County, Unincorporated Areas	130076	03060109 03060202 03060204	13103C0362E 13103C0363E 13103C0364E 13103C0366E 13103C0370E 13103C0380F 13103C0385F 13103C0410E 13103C0426E	
Guyton, City of	130456	03060202	13103C0210E 13103C0235E 13103C0245E 13103C0250E 13103C0251F[1]	
Rincon, City of	130426	03060109	13103C0259E 13103C0267E 13103C0269E 13103C0278E 13103C0286E 13103C0287F 13103C0288E 13103C0289E	
Springfield, City of	130427	03060109	13103C0164E 13103C0168E 13103C0252E 13103C0256E 13103C0257E 13103C0258E 13103C0259E	

[1] Panel Not Printed

1.4 Considerations for using this Flood Insurance Study Report

The NFIP encourages State and local governments to implement sound floodplain management programs. To assist in this endeavor, each FIS Report provides floodplain data, which may include a combination of the following: 10-, 4-, 2-, 1-, and 0.2-percent annual chance flood elevations (the 1% annual chance flood elevation is also referred to as the Base Flood Elevation (BFE)); delineations of the 1% annual chance and 0.2% annual chance floodplains; and 1% annual chance floodway. This information is presented on the FIRM and/or in many components of the FIS Report, including Flood Profiles, Floodway Data tables, Summary of Non-Coastal Stillwater Elevations tables, and Coastal Transect Parameters tables (not all components may be provided for a specific FIS).

This section presents important considerations for using the information contained in this FIS Report and the FIRM, including changes in format and content. Figures 1, 2, and 3 present information that applies to using the FIRM with the FIS Report.

- Part or all of this FIS Report may be revised and republished at any time. In addition, part of this FIS Report may be revised by a Letter of Map Revision (LOMR), which does not involve republication or redistribution of the FIS Report. Refer to Section 6.5 of this FIS Report for information about the process to revise the FIS Report and/or FIRM.

  It is, therefore, the responsibility of the user to consult with community officials by contacting the community repository to obtain the most current FIS Report components. Communities participating in the NFIP have established repositories of flood hazard data for floodplain management and flood insurance purposes. Community map repository addresses are provided in Table 31, "Map Repositories," within this FIS Report.

- New FIS Reports are frequently developed for multiple communities, such as entire counties. A countywide FIS Report incorporates previous FIS Reports for individual communities and the unincorporated area of the county (if not jurisdictional) into a single document and supersedes those documents for the purposes of the NFIP.

  The initial Countywide FIS Report for Effingham County became effective on December 17, 2010. Refer to Table 28 for information about subsequent revisions to the FIRMs.

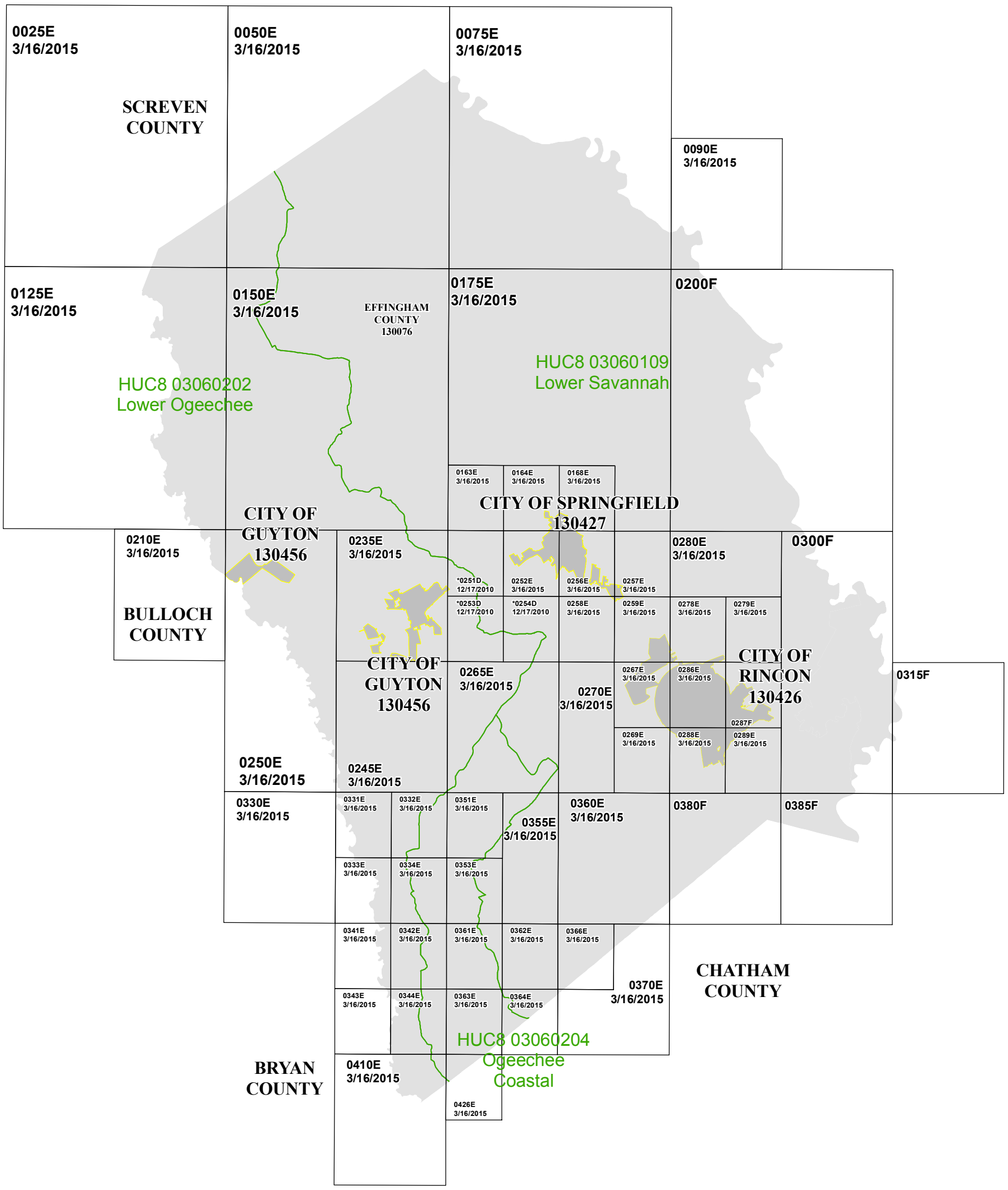
- Selected FIRM panels for the community may contain information (such as floodways and cross sections) that was previously shown separately on the corresponding Flood Boundary and Floodway Map panels. In addition, former flood hazard zone designations have been changed as follows:

Old Zone	New Zone
A1 through A30	AE
B	X (shaded)
C	X (unshaded)

  The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Visit the FEMA Web site at www.fema.gov/national-flood-insurance-program-community-rating-system or contact your appropriate FEMA Regional Office for more information about this program.

- FEMA has developed a *Guide to Flood Maps* (FEMA 258) and online tutorials to assist users in accessing the information contained on the FIRM. These include how to read panels and step-by-step instructions to obtain specific information. To obtain this guide and other assistance in using the FIRM, visit the FEMA Web site at www.fema.gov/online-tutorials.

The FIRM Index in Figure 1 shows the overall FIRM panel layout within Effingham County, and also displays the panel number and effective date for each FIRM panel in the county. Other information shown on the FIRM Index includes community boundaries, transportation features, and flooding sources.



N

1 inch = 3 miles

Miles

0 1.5 3 6 9

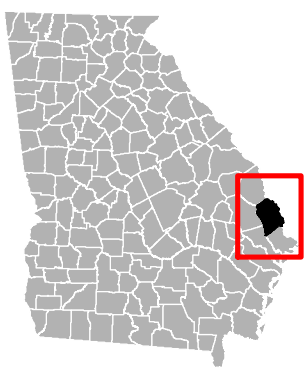
Map Projection:
Universal Transverse Mercator Zone 17 North
North American Datum 1983

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTP://MSC.FEMA.GOV

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION

*PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX

EFFINGHAM COUNTY, GEORGIA and Incorporated Areas

PANELS PRINTED:

0025E, 0050E, 0075E, 0090E, 0125E, 0150E, 0163E, 0164E, 0168E, 0175E, 0200E, 0210E, 0235E, 0245E, 0250E, 0252E, 0256E, 0257E, 0258E, 0259E, 0265E, 0267E, 0269E, 0270E, 0278E, 0279E, 0280E, 0286E, 0287F, 0288E, 0289E, 0300F, 0315F, 0330E, 0331E, 0332E, 0333E, 0334E, 0341E, 0342E, 0343E, 0344E, 0351E, 0353E, 0355E, 0360E, 0361E, 0362E, 0363E, 0364E, 0366E, 0370E, 0380F, 0385F, 0410E, 0426E

PRELIMINARY
11/16/2015

FEMA

MAP NUMBER
13103CIND0C

MAP REVISED

Each FIRM panel may contain specific notes to the user that provide additional information regarding the flood hazard data shown on that map. However, the FIRM panel does not contain enough space to show all the notes that may be relevant in helping to better understand the information on the panel. Figure 2 contains the full list of these notes.

Figure 2: FIRM Notes to Users

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products, or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Flood Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to Table 28 in this FIS Report.

To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

PRELIMINARY FIS REPORT: FEMA maintains information about map features, such as street locations and names, in or near designated flood hazard areas. Requests to revise information in or near designated flood hazard areas may be provided to FEMA during the community review period, at the final Consultation Coordination Officer's meeting, or during the statutory 90-day appeal period. Approved requests for changes will be shown on the final printed FIRM.

The map is for use in administering the NFIP. It may not identify all areas subject to flooding, particularly from local drainage sources of small size. Consult the community map repository to find updated or additional flood hazard information.

BASE FLOOD ELEVATIONS: For more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, consult the Flood Profiles and Floodway Data and/or Summary of Non-Coastal Stillwater Elevations tables within this FIS Report. Use the flood elevation data within the FIS Report in conjunction with the FIRM for construction and/or floodplain management.

FLOODWAY INFORMATION: Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the FIS Report for this jurisdiction.

FLOOD CONTROL STRUCTURE INFORMATION: Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 4.3 "Non-Levee Flood Protection Measures" of this FIS Report for information on flood control structures for this jurisdiction.

Figure 2. FIRM Notes to Users - continued

PROJECTION INFORMATION: The projection used in the preparation of the map was State Plane Georgia East (FIPS 1001 Feet). The horizontal datum was NAD83. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

ELEVATION DATUM: Flood elevations on the FIRM are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

Local vertical monuments may have been used to create the map. To obtain current monument information, please contact the appropriate local community listed in Table 31 of this FIS Report.

BASE MAP INFORMATION: Base map information shown on the FIRM was provided by Fugro EarthData, Inc., produced at a scale of 1:1,200, from aerial photography dated Feburary 2008 or later.

Base map information shown on the FIRM was provided in digital format by Effingham County GIS Department. This information was photgrammetrically compiled at a scale of 1"=200' from aerial photography dated 2008 or later. For information about base maps, refer to Section 6.2 "Base Map" in this FIS Report.

The map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map.

Corporate limits shown on the map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after the map was published, map users should contact appropriate community officials to verify current corporate limit locations.

NOTES FOR FIRM INDEX

REVISIONS TO INDEX: As new studies are performed and FIRM panels are updated within Effingham County, Georgia, corresponding revisions to the FIRM Index will be incorporated within the FIS Report to reflect the effective dates of those panels. Please refer to Table 28 of this FIS Report to determine the most recent FIRM revision date for each community. The most recent FIRM panel effective date will correspond to the most recent index date.

Figure 2. FIRM Notes to Users - continued

SPECIAL NOTES FOR SPECIFIC FIRM PANELS

This Notes to Users section was created specifically for Effingham County, Georgia**,** effective October 30, 2015.

FLOOD RISK REPORT: A Flood Risk Report (FRR) may be available for many of the flooding sources and communities referenced in this FIS Report. The FRR is provided to increase public awareness of flood risk by helping communities identify the areas within their jurisdictions that have the greatest risks. Although non-regulatory, the information provided within the FRR can assist communities in assessing and evaluating mitigation opportunities to reduce these risks. It can also be used by communities developing or updating flood risk mitigation plans. These plans allow communities to identify and evaluate opportunities to reduce potential loss of life and property. However, the FRR is not intended to be the final authoritative source of all flood risk data for a project area; rather, it should be used with other data sources to paint a comprehensive picture of flood risk.

Each FIRM panel contains an abbreviated legend for the features shown on the maps. However, the FIRM panel does not contain enough space to show the legend for all map features. Figure 3 shows the full legend of all map features. Note that not all of these features may appear on the FIRM panels in Effingham County.

Figure 3: Map Legend for FIRM

SPECIAL FLOOD HAZARD AREAS: *The 1% annual chance flood, also known as the base flood or 100-year flood, has a 1% chance of happening or being exceeded each year. Special Flood Hazard Areas are subject to flooding by the 1% annual chance flood. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. See note for specific types. If the floodway is too narrow to be shown, a note is shown.*

	Special Flood Hazard Areas subject to inundation by the 1% annual chance flood (Zones A, AE, AH, AO, AR, A99, V and VE)
Zone A	The flood insurance rate zone that corresponds to the 1% annual chance floodplains. No base (1% annual chance) flood elevations (BFEs) or depths are shown within this zone.
Zone AE	The flood insurance rate zone that corresponds to the 1% annual chance floodplains. Base flood elevations derived from the hydraulic analyses are shown within this zone.
Zone AH	The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the hydraulic analyses are shown at selected intervals within this zone.
Zone AO	The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the hydraulic analyses are shown within this zone.
Zone AR	The flood insurance rate zone that corresponds to areas that were formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
Zone A99	The flood insurance rate zone that corresponds to areas of the 1% annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or flood depths are shown within this zone.
Zone V	The flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations are not shown within this zone.
Zone VE	Zone VE is the flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations derived from the coastal analyses are shown within this zone as static whole-foot elevations that apply throughout the zone.

Figure 3: Map Legend for FIRM - continued

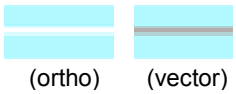
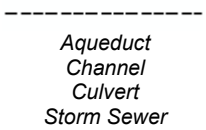
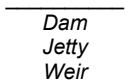
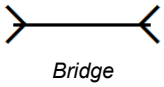
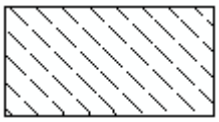
	Regulatory Floodway determined in Zone AE.
OTHER AREAS OF FLOOD HAZARD	
	Shaded Zone X: Areas of 0.2% annual chance flood hazards and areas of 1% annual chance flood hazards with average depths of less than 1 foot or with drainage areas less than 1 square mile.
	Future Conditions 1% Annual Chance Flood Hazard – Zone X: The flood insurance rate zone that corresponds to the 1% annual chance floodplains that are determined based on future-conditions hydrology. No base flood elevations or flood depths are shown within this zone.
	Area with Reduced Flood Risk due to Levee: Areas where an accredited levee, dike, or other flood control structure has reduced the flood risk from the 1% annual chance flood.
OTHER AREAS	
	Zone D (Areas of Undetermined Flood Hazard): The flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.
	Unshaded Zone X: Areas of minimal flood hazard.
FLOOD HAZARD AND OTHER BOUNDARY LINES	
	Flood Zone Boundary (white line on ortho-photography-based mapping; gray line on vector-based mapping)
	Limit of Study
	Jurisdiction Boundary
	Limit of Moderate Wave Action (LiMWA): Indicates the inland limit of the area affected by waves greater than 1.5 feet
GENERAL STRUCTURES	
	Channel, Culvert, Aqueduct, or Storm Sewer
	Dam, Jetty, Weir
	Levee, Dike, or Floodwall
	Bridge

Figure 3: Map Legend for FIRM - continued

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AND OTHERWISE PROTECTED AREAS (OPA): *CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.*

CBRS AREA 09/30/2009

Coastal Barrier Resources System Area: Labels are shown to clarify where this area shares a boundary with an incorporated area or overlaps with the floodway.



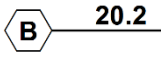
OTHERWISE PROTECTED AREA 09/30/2009

Otherwise Protected Area

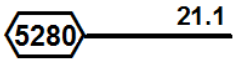
REFERENCE MARKERS

River mile Markers

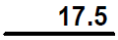
CROSS SECTION & TRANSECT INFORMATION



Lettered Cross Section with Regulatory Water Surface Elevation (BFE)



Numbered Cross Section with Regulatory Water Surface Elevation (BFE)

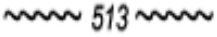


Unlettered Cross Section with Regulatory Water Surface Elevation (BFE)

Coastal Transect

Profile Baseline: Indicates the modeled flow path of a stream and is shown on FIRM panels for all valid studies with profiles or otherwise established base flood elevation.

Coastal Transect Baseline: Used in the coastal flood hazard model to represent the 0.0-foot elevation contour and the starting point for the transect and the measuring point for the coastal mapping.



Base Flood Elevation Line

ZONE AE (EL 16)

Static Base Flood Elevation value (shown under zone label)

ZONE AO (DEPTH 2)

Zone designation with Depth

ZONE AO (DEPTH 2) (VEL 15 FPS)

Zone designation with Depth and Velocity

Figure 3: Map Legend for FIRM - continued

BASE MAP FEATURES	
Missouri Creek	River, Stream or Other Hydrographic Feature
234	Interstate Highway
234	U.S. Highway
234	State Highway
234	County Highway
MAPLE LANE	Street, Road, Avenue Name, or Private Drive if shown on Flood Profile
RAILROAD	Railroad
	Horizontal Reference Grid Line
	Horizontal Reference Grid Ticks
+	Secondary Grid Crosshairs
Land Grant	Name of Land Grant
7	Section Number
R. 43 W. T. 22 N.	Range, Township Number
$^{42}\mathbf{76}^{000m}\mathbf{E}$	Horizontal Reference Grid Coordinates (UTM)
365000 FT	Horizontal Reference Grid Coordinates (State Plane)
80° 16’ 52.5”	Corner Coordinates (Latitude, Longitude)

SECTION 2.0 – FLOODPLAIN MANAGEMENT APPLICATIONS

2.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1% annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2% annual chance (500-year) flood is employed to indicate additional areas of flood hazard in the community.

Each flooding source included in the project scope has been studied and mapped using professional engineering and mapping methodologies that were agreed upon by FEMA and Long County as appropriate to the risk level. Flood risk is evaluated based on factors such as known flood hazards and projected impact on the built environment. Engineering analyses were performed for each studied flooding source to calculate its 1% annual chance flood elevations; elevations corresponding to other floods (e.g. 10-, 4-, 2-, 0.2-percent annual chance, etc.) may have also been computed for certain flooding sources. Engineering models and methods are described in detail in Section 5.0 of this FIS Report. The modeled elevations at cross sections were used to delineate the floodplain boundaries on the FIRM; between cross sections, the boundaries were interpolated using elevation data from various sources. More information on specific mapping methods is provided in Section 6.0 of this FIS Report.

Depending on the accuracy of available topographic data (Table 23), study methodologies employed (Section 5.0), and flood risk, certain flooding sources may be mapped to show both the 1% and 0.2% annual chance floodplain boundaries, regulatory water surface elevations (BFEs), and/or a regulatory floodway. Similarly, other flooding sources may be mapped to show only the 1% annual chance floodplain boundary on the FIRM, without published water surface elevations. In cases where the 1% and 0.2% annual chance floodplain boundaries are close together, only the 1% annual chance floodplain boundary is shown on the FIRM. Figure 3, "Map Legend for FIRM", describes the flood zones that are used on the FIRMs to account for the varying levels of flood risk that exist along flooding sources within the project area.Table 2 and Table 3 indicate the flood zone designations for each flooding source and each community within Long County, Georgia, respectively.

Table 2, "Flooding Sources Included in this FIS Report," lists each flooding source, including its study limits, affected communities, mapped zone on the FIRM, and the completion date of its engineering analysis from which the flood elevations on the FIRM and in the FIS Report were derived. Descriptions and dates for the latest hydrologic and hydraulic analyses of the flooding sources are shown in Table 13. Floodplain boundaries for these flooding sources are shown on the FIRM (published separately) using the symbology described in Figure 3. On the map, the 1% annual chance floodplain corresponds to the SFHAs. The 0.2% annual chance floodplain shows areas that, although out of the regulatory floodplain, are still subject to flood hazards.

Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data. The procedures to remove these areas from the SFHA are described in Section 6.5 of this FIS Report.

Table 2: Flooding Sources Included in this FIS Report

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Birds Branch	Effingham County, Unincorporated Areas	At the confluence with Polly Creek	0.7 miles upstream of the confluence with Polly Creek	03060109	0.70		N	A	2014
Black Creek	Effingham County, Unincorporated Areas	Approximately 32,200 feet upstream of confluence with Savannah River	Norfolk Southern Railroad	03060109	0.70		N	AE	(redelineated in 2010)
Coldbrook Swamp	Effingham County, Unincorporated Areas	At the Chatman County Boundary	Northeast of Goshen Road	03060109	16.8		N		2014
Dasher Creek	Effingham County, Unincorporated Areas; Rincon, City of	Fort Howard Road	Approximately 100 feet upstream of State Highway 21	03060109	2.71		N	AE	1987 (partially redelineated in 2010 and 2014)
Dasher Creek	Effingham County, Unincorporated Areas; Rincon, City of	Approximately 100 feet upstream of State Highway 21	Approximately 11,300 feet upstream of McCall Road	03060109	3.84		N	AE	2004 (redelineated in 2014)
Horning Swamp	Effingham County, Unincorporated Areas	Confluence with St. Augustine Creek	Noel C Conaway Road	03060109	1.90		N	AE	2014
Horning Swamp	Effingham County, Unincorporated Areas	Approximately 1.6 miles downstream of Midland Road	Just downstream of Hodgeville Road	03060109	7.9		N	A	2014

Table 2: Flooding Sources Included in this FIS Report - continued

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Jacks Branch	Effingham County, Unincorporated Areas; Springfield, City of	Confluence with Runs Branch	Arnsdorff Road	03060109	4.07		N	AE	1987 (redelineated in 2010 and 2014)
Little Ogeechee River	Effingham County, Unincorporated Areas	Chatham/Effingham County Boundary	Approximately 2,350 feet upstream of Midland Road	03060204	7.19		N	AE	2014
Little Ogeechee River Convergence	Effingham County, Unincorporated Areas	Convergence with Little Ogeechee River	Divergence with Little Ogeechee Divergence	03060202 03060204	1.19		N	AE	2014
Little Ogeechee River Divergence	Effingham County, Unincorporated Areas	Approximately 100 feet downstream of Sand Hill Road	Divergence with Little Ogeechee River	03060202 03060204	0.97		N	AE	2014
Little Ogeechee River Tributary 1	Effingham County, Unincorporated Areas	Confluence with Little Ogeechee River	Approximately 8,845 feet upstream of State Highway 80	03060204	2.70		N	AE	2014
Lockner Creek	Effingham County, Unincorporated Areas	At the confluence with the Savannah River	Approximately 900 feet upstream of Rincon-Stillwell Road	03060109	3.60		N	A	2014
Lockner Creek Tributary 1	Effingham County, Unincorporated Areas	At the confluence with Lockner Creek	Approximately 750 feet upstream of Nellie Road	03060109	0.90		N	A	2014

Table 2: Flooding Sources Included in this FIS Report - continued

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
Ogeechee River	Effingham County, Unincorporated Areas	Chatham/Effingham County Boundary	Approximately 32,800 feet upstream of U.S. Highway 80	03060202	6.92		v	AE	2014
Polly Creek	Effingham County, Unincorporated Areas; Rincon, City of	Approximately 3,300 feet downstream of Mill Pond Road	1,110 feet upstream of McCall Road	03060109	6.01		Y	AE	2014
Polly Creek	Effingham County, Unincorporated Areas; Rincon, City of	At the confluence with Lockner Creek	Approximately 2,300 feet upstream of State Highway 21	03060109	3.80		Y	AE	2014
Rincon Branch	Effingham County (Unincorportated Areas); Rincon, City of	Confluence with Dasher Creek	2,805 feet upstream of Middle Ground Road	03060109	2.33		N	AE	2014
Runs Branch	Effingham County, Unincorporated Areas; Springfield, City of	From Log Landing Road	Approximately 5,525 feet upstream of State Highway 119	03060109	6.77		N	AE	1987 (redelineated in 2010 and 2014)
Snooks Branch	Springfield, City of	From the confluence with Jacks Branch	West First Street	03060109	0.10		N	AE	1987 (redelineated in 2010 and 2014)

Table 2: Flooding Sources Included in this FIS Report - continued

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
St. Augustine Creek	Effingham County, Unincorporated Areas	Approximately 9,200 feet downstream of Chatham/Effingham County Boundary	Noel C Conaway Road	03060109	3.68		N	AE	2014
Sweigoffer Creek	Effingham County, Unincorporated Areas; Rincon, City of	Old Augusta Road South	Approximately 100 feet upstream of State Highway 21	03060109	2.45		N	AE	1987 (partially redelineated in 2014)
Sweigoffer Creek	Effingham County, Unincorporated Areas; Rincon, City of	Approximately 100 feet upstream of State Highway 21	approximately 4,800 feet upstream of Norfolk-Southern Railway	03060109	2.66		N	AE	2004 (partially redelineated in 2014)
Sweigoffer Creek	Effingham County, Unincorporated Areas	1.0 mile downstream of Hodgeville Road	Just downstream of Hodgeville Road	03060109	1.00		N	A	2014
Three Men Swamp	Effingham County, Unincorporated Areas	At State Highway 30 - Noel C Conaway Road	Approximately 1.5 miles upstream of Midland Road	03060109	7.35		N	A	2014
Unnamed Tributary to Black Creek	Effingham County, Unincorporated Areas	Approximately 2,900 feet upstream of confluence with Black Creek	Approximately 6,925 upstream of confluence with Black Creek	03060109	0.73		N	AE	(redelineated in 2010)

Table 2: Flooding Sources Included in this FIS Report - continued

Flooding Source	Community	Downstream Limit	Upstream Limit	HUC-8 Sub-Basin(s)	Length (mi) (streams or coastlines)	Area (mi^2) (estuaries or ponding)	Floodway (Y/N)	Zone shown on FIRM	Date of Analysis
White Deer Branch	Effingham County, Unincorporated Areas; Springfield, City of	Confluence with Jacks Branch	Pleasant Acres Road	03060109	1.59		N	AE	1987 (redelineated in 2010 and 2014)
Willowpeg Creek	Effingham County, Unincorporated Areas; Rincon, City of	Confluence with Sweigoffer Creek	CSX Transportation Railroad	03060109	1.12		N	AE	2014

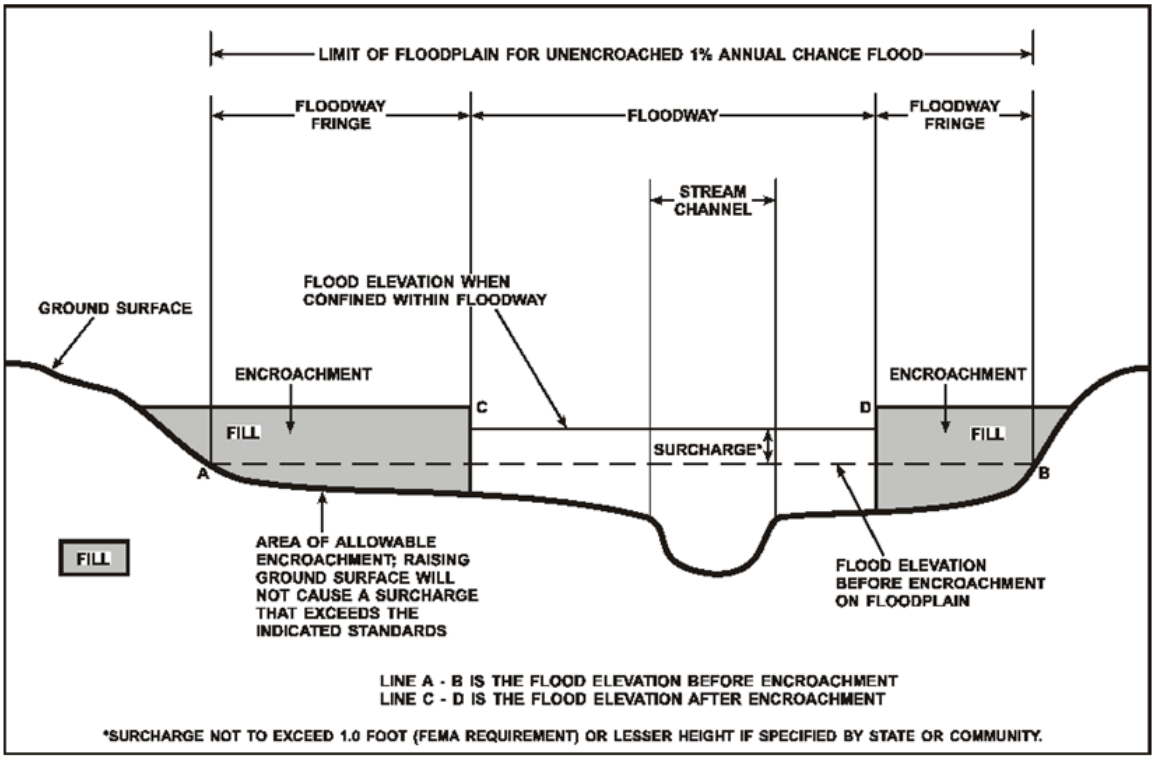
2.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard.

For purposes of the NFIP, a floodway is used as a tool to assist local communities in balancing floodplain development against increasing flood hazard. With this approach, the area of the 1% annual chance floodplain on a river is divided into a floodway and a floodway fringe based on hydraulic modeling. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment in order to carry the 1% annual chance flood. The floodway fringe is the area between the floodway and the 1% annual chance floodplain boundaries where encroachment is permitted. The floodway must be wide enough so that the floodway fringe could be completely obstructed without increasing the water surface elevation of the 1% annual chance flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 4.

To participate in the NFIP, Federal regulations require communities to limit increases caused by encroachment to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this project are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway projects.

Figure 4: Floodway Schematic



Floodway widths presented in this FIS Report and on the FIRM were computed at cross sections.

Between cross sections, the floodway boundaries were interpolated. For certain stream segments, floodways were adjusted so that the amount of floodwaters conveyed on each side of the floodplain would be reduced equally. The results of the floodway computations have been tabulated for selected cross sections and are shown in Table 24, "Floodway Data."

All floodways that were developed for this Flood Risk Project are shown on the FIRM using the symbology described in Each FIRM panel contains an abbreviated legend for the features shown on the maps. However, the FIRM panel does not contain enough space to show the legend for all map features. Figure 3 shows the full legend of all map features. Note that not all of these features may appear on the FIRM panels in Effingham County.
Figure 3. In cases where the floodway and l% annual chance floodplain boundaries are either close together or collinear, only the floodway boundary has been shown on the FIRM. For information about the delineation of floodways on the FIRM, refer to Section 6.3.

2.3 Base Flood Elevations

The hydraulic characteristics of flooding sources were analyzed to provide estimates of the elevations of floods of the selected recurrence intervals. The Base Flood Elevation (BFE) is the elevation of the 1% annual chance flood. These BFEs are most commonly rounded to the whole foot, as shown on the FIRM, but in certain circumstances or locations they may be rounded to 0.1 foot. Cross section lines shown on the FIRM may also be labeled with the BFE rounded to 0.1 foot. Whole-foot BFEs derived from engineering analyses that apply to coastal areas, areas of ponding, or other static areas with little elevation change may also be shown at selected intervals on the FIRM.

Cross sections with BFEs shown on the FIRM correspond to the cross sections shown in the Floodway Data table and Flood Profiles in this FIS Report. BFEs are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM.

2.4 Non-Encroachment Zones

Some States and communities use non-encroachment zones to manage floodplain development. For flooding sources with medium flood risk, field surveys are often not collected and surveyed bridge and culvert geometry is not developed. Standard hydrologic and hydraulic analyses are still performed to determine BFEs in these areas. However, floodways are not typically determined, since specific channel profiles are not developed. To assist communities with managing floodplain development in these areas, a "non-encroachment zone" may be provided. While not a FEMA designated floodway, the non-encroachment zone represents that area around the stream that should be reserved to convey the 1% annual chance flood event. As with a floodway, all surcharges must fall within the acceptable range in the non-encroachment zone.

General setbacks can be used in areas of lower risk (e.g. unnumbered Zone A), but these are not considered sufficient where unnumbered Zone A is replaced by Zone AE. The NFIP requires communities to ensure that any development in a non-encroachment area causes no increase in BFEs. Communities must generally prohibit development within the area defined by the non-encroachment width to meet the NFIP requirement.

2.5 Coastal Flood Hazard Areas

This section is not applicable to this Flood Risk Project.

2.5.1 Water Elevations and the Effects of Waves

This section is not applicable to this Flood Risk Project.

Figure 5: Wave Runup Transect Schematic

[Not Applicable to this Flood Risk Project]

2.5.2 Floodplain Boundaries and BFEs for Coastal Areas

This section is not applicable to this Flood Risk Project.

2.5.3 Coastal High Hazard Areas

This section is not applicable to this Flood Risk Project.

Figure 6: Coastal Transect Schematic

[Not Applicable to this Flood Risk Project]

2.5.4 Limit of Moderate Wave Action

This section is not applicable to this Flood Risk Project.

SECTION 3.0 – INSURANCE APPLICATIONS

3.1 National Flood Insurance Program Insurance Zones

For flood insurance applications, the FIRM designates flood insurance rate zones as described in Each FIRM panel contains an abbreviated legend for the features shown on the maps. However, the FIRM panel does not contain enough space to show the legend for all map features. Figure 3 shows the full legend of all map features. Note that not all of these features may appear on the FIRM panels in Effingham County.
Figure 3, "Map Legend for FIRM." Flood insurance zone designations are assigned to flooding sources based on the results of the hydraulic or coastal analyses. Insurance agents use the zones shown on the FIRM and depths and base flood elevations in this FIS Report in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

The 1% annual chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (e.g. Zones A, AE, V, VE, etc.), and the 0.2% annual chance floodplain boundary corresponds to the boundary of areas of additional flood hazards.

Table 3 lists the flood insurance zones in Effingham County.

Table 3: Flood Zone Designations by Community

Community	Flood Zone(s)
EFFINGHAM COUNTY, UNINCORPORATED AREAS	A, AE, X
GUYTON, CITY OF	A, X
RINCON, CITY OF	A, AE, X
SPRINGFIELD, CITY OF	AE, X

3.2 Coastal Barrier Resources System

This section is not applicable to this Flood Risk Project.

Table 4: Coastal Barrier Resources System Information

[Not Applicable to this Flood Risk Project]

SECTION 4.0 – AREA STUDIED

4.1 Basin Description

Table 5 contains a description of the characteristics of the HUC-8 sub-basins within which each community falls. The table includes the main flooding sources within each basin, a brief description of the basin, and its drainage area.

Table 5: Basin Characteristics

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin Number	Primary Flooding Source	Description of Affected Area	Drainage Area (square miles)
Lower Ogeechee	03060202	Little Ogeechee River Convergence, Little Ogeechee River Divergence, Ogeechee River	Drainage watershed area for Ogeechee River and portions of the Little Ogeechee River Convergence and Little Ogeechee River Divergence extending from north to south and covering most of the western portion of Long County	Not Available
Lower Savannah	03060109	Black Creek, Dasher Creek, Horning Swamp, Jacks Branch, Polly Creek, Rincon Branch, Runs Branch, Snooks Branch, St. Augustine Creek, Sweigoffer Creek, Unnamed Tributary to Black Creek, White Deer Branch, Willowpeg Creek	Drainage watershed for majority of Long County extending from north to south and covering most of the eastern portion of Long County	Not Available

Table 5: Basin Characteristics - continued

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin Number	Primary Flooding Source	Description of Affected Area	Drainage Area (square miles)
Ogeechee Coastal	03060204	Little Ogeechee River, Little Ogeechee River Convergence, Little Ogeechee River Divergence, Little Ogeechee River Tributary 1	Drainage watershed area for Little Ogeechee River and portions of the Little Ogeechee River Convergence and Little Ogeechee River Divergence located in the southwestern portion of Long County	Not Available

4.2 Principal Flood Problems

Table 6 contains a description of the principal flood problems that have been noted for Effingham County by flooding source.

Table 6: Principal Flood Problems

Flooding Source	Description of Flood Problems
Miscellaneous within Effingham County, Georgia	Major floods have occurred during all seasons of the year on the streams described in this study. The largest recorded flood in the area occurred in September-October 1929. In addition to floods caused by general rainfall, Effingham County is susceptible to floods caused by hurricane and tropical storm activity Hurricanes normally occur in the summer and early fall months. According to the National Oceanic and Atmospheric Administration (formerly the Environmental Science Service Administrations (ESSA)), major hurricanes have impacted the area in August 1911, September 1924, September 1928, September 1929, August 1940, October 1947, August and September 1964 (ESSA, 1970). The Georgia Emergency Management Agency declared states of emergency associated with hurricanes and tropical storms occurring in Effingham County on October 1994, August 1995, September 1996, September 1999, August 2004, and September 2004.

Table 7: Historic Flooding Elevations

[Not Applicable to this Flood Risk Project]

4.3 Non-Levee Flood Protection Measures

This section is not applicable to this Flood Risk Project.

Table 8: Non-Levee Flood Protection Measures

[Not Applicable to this Flood Risk Project]

4.4 Levees

This section is not applicable to this Flood Risk Project.

Table 9: Levees

[Not Applicable to this Flood Risk Project]

SECTION 5.0 – ENGINEERING METHODS

For the flooding sources in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded at least once on the average during any 10-, 25-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 25-, 50-, 100-, and 500-year floods, have a 10-, 4-, 2-, 1-, and 0.2% annual chance, respectively, of being equaled or exceeded during any year.

Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedance) during the term of a 30-year mortgage is approximately 26 percent (about 3 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

The engineering analyses described here incorporate the results of previously issued Letters of Map Change (LOMCs) listed in Table 27, "Incorporated Letters of Map Change", which include Letters of Map Revision (LOMRs). For more information about LOMRs, refer to Section 6.5, "FIRM Revisions."

5.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak elevation-frequency relationships for floods of the selected recurrence intervals for each flooding source studied. Hydrologic analyses are typically performed at the watershed level. Depending on factors such as watershed size and shape, land use and urbanization, and natural or man-made storage, various models or methodologies may be applied. A summary of the hydrologic methods applied to develop the discharges used in the hydraulic analyses for each stream is provided in Table 13. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

Precountywide Analysis

To determine the flood potential of the study area, a statistical analysis of storms and floods that have occurred in regions of like topography, watershed cover, and physical characteristics were made.

No streamflow records were available for the Little Ogeechee River, St. Augustine Creek, or Horning Swamp drainage basins. Regional frequency equations developed by the U.S. Geological Survey (USGS) from multiple regression analyses were used to establish peak discharge-frequency relationships for each flooding source studied in detail (USGS, 1979).

For comparison purposes only, peak discharges were computed using USGS techniques for simulating sub-basin hydrography, and the USACE, Hydrologic Engineering Center (HEC)

computer program, HEC-1, Flood Hydrograph Package for channel routing (HEC, 1987; USGS, 1987).

December 17, 2010 Initial Countywide FIS Report

Discharges for the approximate analysis streams were estimated using the published USGS regional regression equations for rural areas in Georgia (Stamey and Hess, 1993). Regression equations estimate the peak discharges for unguaged streams based on characteristics of nearby gauged streams. Drainage areas were developed from USGS 30-meter Digital Elevation Models (DEMs).

Discharges for the additional data on Dasher Creek and Sweigoffer Creek were modeled using the USACE, HEC computer program, HEC-HMS, version 2.1 (HEC, 2001), and the USGS 30-meter DEMs.

A summary of stillwater elevations developed for non-coastal flooding sources is provided in **Error! Reference source not found.**. (Coastal stillwater elevations are discussed in Section 5.3 and shown in **Error! Reference source not found.**.) Stream gage information is provided in Table 12.

March 16, 2015 Revised Countywide

The USACE, HEC computer program, HEC-HMS, version 3.5 (HEC, 2010b), was used to calculate flows along the streams newly studied or revised by detailed methods for this countywide FIS report, except for Horning Swamp, Ogeechee River, Polly Creek, and St. Augustine Creek.

The hydrologic analysis for Polly Creek was provided by the USACE and the hydrologic analysis for Ogeechee River was provided by Thomas and Hutton Engineering Company.

The USGS regional regression equations for the State of Georgia were used to calculate flows along the streams studied by approximate methods with the exception of Birds Branch, Lockner Creek, Lockner Creek Tributary 1, and the Ogeechee River. Two USGS Scientific Investigation Reports (SIR) were used as the basis for the analysis:

- USGS SIR 2009-5043, (USGS, 2009a); and
- USGS SIR 2011-5042, (USGS, 2011a)

Methods described in SIR 2009-5043 (USGS, 2009a) are intended for rural areas, with impervious area less than ten percent, and are not applicable for urban sites. In order to determine if the study areas were rural, impervious surface areas for each drainage basin were identified based the on the Georgia Land Use Trends Impervious Surface Cover of Georgia data (NARSAL, 2011).

USGS gage station 02202500 was utilized to obtain the peak flows along the Ogeechee River within Effingham County.

USGS gage station 02198690 Ebenezer Creek at Springfield, GA was used in the approximate study along Runs Branch (Runs Branch is also known as Ebenezer Creek). Peak discharges along Runs Branch were estimated based on methodologies described on SIR 2009-5043 (USGS, 2009a).

The hydrologic analyses for Birds Branch, Lockner, and Lockner Creek Tributary 1 were provided by the USACE.

An unsteady two-dimensional (2D) analysis was used to model selected approximate, limited detailed, and detailed study streams. The detailed streams include Horning Swamp and St. Augustine Creek. These streams were selected for 2D analysis based on their flat swampy nature.

The 2D modeling software, FLO-2D version 2009.06 Build 09-11.08.07, was used to model rainfall runoff in the 2D watersheds. FLO-2D performs 2D overland unconfined flood routing in 8 directions. The 2D modeling approach is appropriate in flat areas and/or when the flood volume determines the area of inundation. Models were assembled for the watersheds using a 100 foot cell size totaling 176,984 cells. FLO-2D Grid Developer System was used to assist in preparing input files.

The 24-hour rainfall depths were taken from the Georgia Stormwater Management Manual (GSWMM) (Atlanta Regional Commission, 2001). In order to calculate the 0.2-percent-annual-chance rainfall depth, the more frequent rainfall depths were plotted on log-probability paper and the lower recurrence interval data was extrapolated.

The rainfall losses were estimated using the Natural Resources Conservation Service (NRCS), formerly the Soil Conservation Service (SCS) approach presented in Technical Release 55 (SCS, 1986). A curve number was determined for each sub-basin based on the soil type, hydrologic soil group, and land use.

The NRCS unit hydrograph transform method was used for this study. The time of concentration was calculated using the lag time equations found in the GSWMM.

October 30, 2015 Partial Map Revision

No new Hydrologic analyses were carried out for this revision.

A summary of the discharges is provided in Table 10. Frequency Discharge-Drainage Area Curves used to develop the hydrologic models may also be shown in Figure 7 for selected flooding sources.

Table 10: Summary of Discharges

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Black Creek	Approximately 100 feet downstream of Seaboard Coast Railroad Timber Trestle	13.4	*	*	*	884	*	*
Dasher Creek	Fort Howard Road	13.4	1,020	*	1,840	2,260	*	3,480
Dasher Creek	Just downstream of Rincon Branch	10.8	880	*	1,580	1,920	*	2,980
Dasher Creek	Just upstream of Rincon Branch	6.0	620	*	1,120	1,380	*	2,120
Dasher Creek	Approximately 90 feet upstream of Railroad (2nd Crossing)	5.2	580	*	1,030	1,260	*	1,960
Horning Swamp	Confluence with St. Augustine Creek	11.2	537	*	861	1,055	*	1,456
Jacks Branch	Confluence with Runs Branch	21.3	1,290	*	2,310	2,910	*	4,510
Jacks Branch	Old Tusculum Road	9.7	840	*	1,510	1,890	*	2,930
Jacks Branch	Arnsdorff Road	7.4	710	*	1,280	1,610	*	2,490
Little Ogeechee River	Chatham/Effingham County Boundary	26.8	1,665	*	2,636	3,063	*	3,827
Little Ogeechee River	Georgia Central Rail	21.5	1,388	*	2,266	2,603	*	3,269
Little Ogeechee River	U.S. Highway 80	17.4	1,387	*	1,945	2,177	*	2,740

Table 10: Summary of Discharges - continued

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Little Ogeechee River	Approximately 3,500 feet downstream of Blue Jay Road	12.9	734	*	1,119	1,601	*	2,466
Little Ogeechee River	State Highway 17	7.0	956	*	1,385	1,558	*	1,861
Little Ogeechee River Convergence	*	*	*	*	*	*	*	*
Little Ogeechee River Divergence	*	*	*	*	*	*	*	*
Little Ogeechee River Tributary 1	*	*	*	*	*	*	*	*
Ogeechee River	Approximately 11,100 feet downstream of Interstate Highway 16	2,982	24,228	*	37,554	44,018	*	58,344
Ogeechee River	U.S. Highway 80	2,650	22,256	*	34,987	41,039	*	54,465
Ogeechee River	Approximately 31,150 feet upstream of U.S. Highway 80	2,647	22,509	*	34,961	41,009	*	54,426
Polly Creek	Approximately 1,110 feet upstream of Macall Road	6.8	509	*	793	988	*	1,313
Polly Creek	Confluence with Lockner Creek	12.6	834	*	1,359	1,728	*	2,330
Rincon Branch	Confluence with Dasher Creek	2.2	712	*	986	1,109	*	1,321

Table 10: Summary of Discharges - continued

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Rincon Branch	Just upstream of State Highway 21	1.4	342	*	478	538	*	642
Runs Branch	Log Landing Road	186.7	6,020	*	10,820	13,560	*	21,000
Runs Branch	Stillwell Road	181.0	5,770	*	10,370	13,000	*	20,120
Runs Branch	State Highway 119	153.0	5,070	*	9,110	11,410	*	17,680
Snooks Branch	Confluence with Jacks Branch	1.0	220	*	390	490	*	760
St. Augustine Creek	Chatham/Effingham County Boundary	24.7	1,168	*	1,891	2,210	*	2,821
Sweigoffer Creek	Old Augusta South Road	6.6	680	*	1,220	1,520	*	2,300
Sweigoffer Creek	Just upstream of confluence of Willowpeg Creek	3.8	480	*	860	1,070	*	1,620
Sweigoffer Creek	State Highway 21/South Columbia Avenue	2.9	330	*	590	730	*	1,110
Unnamed Tributary to Black Creek	Approximately 3,000 feet upstream of the confluence of Black Creek	1.9	*	*	*	288	*	*
White Deer Branch	State Highway 119	5.6	600	*	1,080	1,360	*	2,100
White Deer Branch	Shearhouse Spur	4.1	490	*	880	1,100	*	1,710
White Deer Branch	Pleasant Acres Road	3.5	450	*	810	1,020	*	1,580

Table 10: Summary of Discharges - continued

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Willowpeg Creek	Confluence with Sweigoffer Creek	1.0	539	*	741	832	*	992
Willowpeg Creek	Just upstream of State Highway 25	0.5	190	*	276	314	*	380

*Not calculated for this Flood Risk Project

Figure 7: Frequency Discharge-Drainage Area Curves

[Not Applicable to this Flood Risk Project]

Table 11: Summary of Non-Coastal Stillwater Elevations

[Not Applicable to this Flood Risk Project]

Table 12: Stream Gage Information used to Determine Discharges

Flooding Source	Gage Identifier	Agency that Maintains Gage	Site Name	Drainage Area (Square Miles)	Period of Record	
					From	To
Runs Branch	02198690	USGS	Ebenezer Creek at Springfield, GA			
Ogeechee River	02202500	USGS	Ogeechee River near Eden, GA			

5.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Base flood elevations on the FIRM represent the elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report. Rounded whole-foot elevations may be shown on the FIRM in coastal areas, areas of ponding, and other areas with static base flood elevations. These whole-foot elevations may not exactly reflect the elevations derived from the hydraulic analyses. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM. The hydraulic analyses for this FIS were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

Precountywide Analysis

Cross sections and structural data for bridges and culverts were obtained by field surveys.

The water surface elevations (WSELs) for Dasher Creek, Runs Branch, Jacks Branch, Polly Creek, Snooks Branch, Sweigoffer Creek, White Deer Branch, and Willowpeg Creek for the floods of the selected recurrence intervals were computed through the use of the USACE, HEC computer program, HEC-2 (HEC, 1984). Starting WSELs were determined using the slope-area method.

December 17, 2010 Initial Countywide FIS Report

For the streams studied by approximate methods, cross section data was obtained from the USGS 10-meter DEMs. Hydraulically significant roads were modeled as bridges, with opening data collected from available inventory data or approximated from the imagery. Top of road elevations were estimated from the best available topography. The streams studied by approximate methods were modeled using the USACE, HEC computer program, HEC-RAS, version 4.0.0 (HEC, 2008).

Additional field surveying and Light Detection and Ranging (LiDAR) data for Dasher Creek and Sweigoffer Creek were used to create a computer model using the USACE, HEC computer program, HEC-RAS, version 3.1.1 (HEC, 2004). Downstream boundary conditions were set to normal depth.

Channel roughness factors (Mannings "n") used in the hydraulic computations for Dasher Creek, from approximately 100 feet upstream of State Highway 21 to approximately 11,300 feet upstream of McCall Road and Sweigoffer Creek, from approximately 100 feet upstream of State Highway 21 to approximately 4,800 feet upstream of Norfolk Southern Railway were estimated by Watershed Concepts (Watershed Concepts, 2004).

March 16, 2015 Revised Countywide

For streams studied by detailed methods for this countywide FIS, floodplain cross sections were placed at representative locations, approximately 500 feet apart along the stream centerline. Cross sections were spaced at closer intervals along the upper reaches of the streams and at locations of sudden changes in stream geometry or direction. The cross sectional geometry was comprised of field collected survey data and the LiDAR data. Surveyed channel sections were obtained at the bridge and culvert faces. Additional survey was also provided on an "as-needed" basis at bridge approach sections and at long stretches of stream between structures. Surveyed channel sections were transferred upstream and downstream to non-surveyed cross sections and were blended with the LiDAR data to create a consistent channel profile.

Survey was performed for over 20 bridge/culverts crossing and numerous riverine cross sections over approximately 37 miles of stream in Effingham County. At each of the structures, channel cross sections immediately upstream and downstream of the crossing were surveyed along with road grade elevations. Sketches and digital photos were taken at each bridge, culvert, and dam in order to document the dimensions of the hydraulic structures.

For streams studied by detailed methods for this countywide FIS, WSELs were computed using the USACE, HEC computer program, HEC-RAS, version 4.1.0 (HEC, 2010a).

The starting WSELs for all recurrence interval event profiles in the HEC-RAS models were estimated using the slope-area method (normal depth) with the exception of Little Ogeechee River. Little Ogeechee River used known WSELs from the FIS dated December 17, 2010 (FEMA, 2010). For selected streams studied by approximate and limited detailed methods, cross section data was obtained from the topography. The studied streams were modeled using FLO-2D, version 2009.06 Build 09-11.08.07.

For the remaining streams studied by approximate methods for this countywide FIS, cross section data was obtained from the topography. Roads were modeled as bridges with cross-sections upstream and downstream of the structure. The studied streams were modeled using the USACE, HEC computer program, HEC-RAS version 4.1.0 (HEC, 2010a).

October 30, 2015 Partial Map Revision

No new Hydrologic analyses were carried out for this revision.

For streams for which hydraulic analyses were based on cross sections, locations of selected cross sections are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 6.3), selected cross sections are also listed on Table 24, "Floodway Data."

A summary of the methods used in hydraulic analyses performed for this project is provided in Table 13. Roughness coefficients are provided in Table 14. Roughness coefficients are values representing the frictional resistance water experiences when passing overland or through a channel. They are used in the calculations to determine water surface elevations. Greater detail (including assumptions, analysis, and results) is available in the archived project documentation.

Table 13: Summary of Hydrologic and Hydraulic Analyses

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Birds Branch	At the confluence with Polly Creek	0.7 miles upstream of the confluence with Polly Creek	provided by USACE	Leveraged USACE HEC-RAS	2014	A	
Black Creek	Approximately 32,200 feet upstream of confluence with Savannah River	Norfolk Southern Railroad	USGS regional frequency equations	N/A	1987 (redelineated in 2010)	AE	Peak discharge-frequency relationships developed from USGS regional frequency equations from multiple regression analyses
Coldbrook Swamp	At the Chatman County Boundary	Northeast of Goshen Road	FLO-2D version 2009.06 Build 09-11.08.07	FLO-2D version 2009.06 Build 09-11.08.07	2014	N/A	
Dasher Creek	Fort Howard Road	Approximately 100 feet upstream of State Highway 21	Regional Frequency Equations from multiple regression analyses USGS (USGS 1979)	HEC-2 (HEC, 1984)	1987 (partially redelineated in 2010 and 2014)	AE	Hydrology and hydraulics performed by USACE, Savannah District (USACE 1976a), (USACE 1976b). For comparison only, peak discharges computed using USGS techniques for simulating sub-basin hydrography and the USACE, Hydrologic Engineering Center (HEC) computer program, HEC-1, Flood Hydrograph Package for channel routing (HEC 1987, USGS 1987). Starting WSELs estimated using the slope-area method.
Dasher Creek	Approximately 100 feet upstream of State Highway 21	Approximately 11,300 feet upstream of McCall Road	HEC-HMS, version 2.1 (HEC, 2001)	HEC-RAS, version 3.1.1 (HEC, 2004)	2004 (redelineated in 2014)	AE	

Table 13: Summary of Hydrologic and Hydraulic Analyses - continued

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Horning Swamp	Confluence with St. Augustine Creek	Noel C Conaway Road	FLO-2D version 2009.06 Build 09-11.08.07	HEC-RAS, version 4.1.0 (HEC, 2010a)	2014	AE	Unsteady two-dimensional (2D) analysis, 100 foot cell size. WSELs estimated using the slope-area method (normal depth)
Horning Swamp	Approximately 1.6 miles downstream of Midland Road	Just downstream of Hodgeville Road	FLO-2D version 2009.06 Build 09-11.08.07	FLO-2D version 2009.06 Build 09-11.08.07	2014	A	
Jacks Branch	Confluence with Runs Branch	Arnsdorff Road	Regional Frequency Equations from multiple regression analyses USGS (USGS 1979)	HEC-2 (HEC, 1984)	1987 (redelineated in 2010 and 2014)	AE	Hydrology and hydraulics performed by USACE, Savannah District (USACE 1976a), (USACE 1976b). For comparison only, peak discharges computed using USGS techniques for simulating sub-basin hydrography and the HEC-1, Flood Hydrograph Package for channel routing (HEC 1987, USGS 1987). Starting WSELs estimated using the slope-area method.
Little Ogeechee River	Chatham/Effingham County Boundary	Approximately 2,350 feet upstream of Midland Road	HEC-HMS, version 3.5 (HEC, 2010b)	HEC-RAS, version 4.1.0 (HEC, 2010a)	2014	AE	Used known WSELs from the FIS dated December 17, 2010 (FEMA, 2010)
Little Ogeechee River Convergence	Convergence with Little Ogeechee River	Divergence with Little Ogeechee Divergence	HEC-HMS, version 3.5 (HEC, 2010b)	HEC-RAS, version 4.1.0 (HEC, 2010a)	2014	AE	WSELs estimated using the slope-area method (normal depth)

Table 13: Summary of Hydrologic and Hydraulic Analyses - continued

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Little Ogeechee River Divergence	Approximately 100 feet downstream of Sand Hill Road	Divergence with Little Ogeechee River	HEC-HMS, version 3.5 (HEC, 2010b)	HEC-RAS, version 4.1.0 (HEC, 2010a)	2014	AE	WSELs estimated using the slope-area method (normal depth)
Little Ogeechee River Tributary 1	Confluence with Little Ogeechee River	Approximately 8,845 feet upstream of State Highway 80	HEC-HMS, version 3.5 (HEC, 2010b)	HEC-RAS, version 4.1.0 (HEC, 2010a)	2014	AE	WSELs estimated using the slope-area method (normal depth)
Lockner Creek	At the confluence with the Savannah River	Approximately 900 feet upstream of Rincon-Stillwell Road	provided by USACE	Leveraged USACE HEC-RAS	2014	A	hydrology and hydraulic analyses provided by the USACE
Lockner Creek Tributary 1	At the confluence with Lockner Creek	Approximately 750 feet upstream of Nellie Road	provided by USACE	Leveraged USACE HEC-RAS	2014	A	hydrology and hydraulic analyses provided by the USACE
Ogeechee River	Chatham/Effingham County Boundary	Approximately 32,800 feet upstream of U.S. Highway 80	Provided by Thomas and Hutton Engineering Company	HEC-RAS, version 4.1.0 (HEC, 2010a)	2014	AE	WSELs estimated using the slope-area method (normal depth)
Polly Creek	Approximately 3,300 feet downstream of Mill Pond Road	1,110 feet upstream of McCall Road	provided by the USACE	HEC-RAS, version 4.1.0 (HEC, 2010a)	2014	AE	WSELs estimated using the slope-area method (normal depth)

Table 13: Summary of Hydrologic and Hydraulic Analyses - continued

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Polly Creek	At the confluence with Lockner Creek	Approximately 2,300 feet upstream of State Highway 21	provided by USACE	Leveraged USACE HEC-RAS	2014	AE	hydrology and hydraulic analyses provided by the USACE
Rincon Branch	Confluence with Dasher Creek	2,805 feet upstream of Middle Ground Road	HEC-HMS, version 3.5	HEC-RAS, version 4.1.0	2014	AE	WSELs estimated using the slope-area method (normal depth)
Runs Branch	From Log Landing Road	Approximately 5,525 feet upstream of State Highway 119	Regional Frequency Equations from multiple regression analyses USGS (USGS 1979)	HEC-2 (HEC, 1984)	1987 (redelineated in 2010 and 2014)	AE	Hydrology and hydraulics performed by USACE, Savannah District (USACE 1976a), (USACE 1976b). For comparison only, peak discharges computed using USGS techniques for simulating sub-basin hydrography and the HEC-1, Flood Hydrograph Package for channel routing (HEC 1987, USGS 1987). Starting WSELs estimated using the slope-area method.
Snooks Branch	From the confluence with Jacks Branch	West First Street	Regional Frequency Equations from multiple regression analyses USGS (USGS 1979)	HEC-2 (HEC, 1984)	1987 (redelineated in 2010 and 2014)	AE	Hydrology and hydraulics performed by USACE, Savannah District (USACE 1976a), (USACE 1976b). For comparison only, peak discharges computed using USGS techniques for simulating sub-basin hydrography and the HEC-1, Flood Hydrograph Package for channel routing (HEC 1987, USGS 1987). Starting WSELs estimated using the slope-area method.

Table 13: Summary of Hydrologic and Hydraulic Analyses - continued

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
St. Augustine Creek	Approximately 9,200 feet downstream of Chatham/Effingham County Boundary	Noel C Conaway Road	FLO-2D version 2009.06 Build 09-11.08.07	HEC-RAS, version 4.1.0 (HEC, 2010a)	2014	AE	Unsteady two-dimensional (2D) analysis, 100 foot cell size. WSELs estimated using the slope-area method (normal depth)
Sweigoffer Creek	Old Augusta Road South	Approximately 100 feet upstream of State Highway 21	Regional Frequency Equations from multiple regression analyses USGS (USGS 1979)	HEC-2 (HEC, 1984)	1987 (partially redelineated in 2014)	AE	Hydrology and hydraulics performed by USACE, Savannah District (USACE 1976a), (USACE 1976b). For comparison only, peak discharges computed using USGS techniques for simulating sub-basin hydrography and the HEC-1, Flood Hydrograph Package for channel routing (HEC 1987, USGS 1987). Starting WSELs estimated using the slope-area method.
Sweigoffer Creek	Approximately 100 feet upstream of State Highway 21	Approximately 4,800 feet upstream of Norfolk-Southern Railway	HEC-HMS, version 2.1	HEC-RAS, version 3.1.1	2010	AE	
Sweigoffer Creek	1.0 mile downstream of Hodgeville Road	Just downstream of Hodgeville Road	FLO-2D version 2009.06 Build 09-11.08.07	FLO-2D version 2009.06 Build 09-11.08.07	2014	A	

Table 13: Summary of Hydrologic and Hydraulic Analyses - continued

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Three Men Swamp	At State Highway 30 - Noel C Conaway Road	Approximately 1.5 miles upstream of Midland Road	FLO-2D version 2009.06 Build 09-11.08.07	FLO-2D version 2009.06 Build 09-11.08.07	2014	A	
Unnamed Tributary to Black Creek	Approximately 2,900 feet upstream of confluence with Black Creek	Approximately 6,925 upstream of confluence with Black Creek	Regional Frequency Equations from multiple regression analyses USGS (USGS 1979)	N/A	1987 (redelineated in 2010)	AE	Peak discharge-frequency relationships developed from USGS regional frequency equations from multiple regression analyses
White Deer Branch	Confluence with Jacks Branch	Pleasant Acres Road	Regional Frequency Equations from multiple regression analyses USGS (USGS 1979)	HEC-2 (HEC, 1984)	1987 (redelineated in 2010 and 2014)	AE	Hydrology and hydraulics performed by USACE, Savannah District (USACE 1976a), (USACE 1976b). For comparison only, peak discharges computed using USGS techniques for simulating sub-basin hydrography and the HEC-1, Flood Hydrograph Package for channel routing (HEC 1987, USGS 1987). Starting WSELs estimated using the slope-area method.
Willowpeg Creek	Confluence with Sweigoffer Creek	CSX Transportation Railroad	HEC-HMS, version 3.5 (HEC, 2010b)	HEC-RAS, version 4.1.0 (HEC, 2010a)	2014	AE	WSELs estimated using the slope-area method (normal depth)

Table 13: Summary of Hydrologic and Hydraulic Analyses - continued

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Miscellaneuos Approximate Streams; (Gadny Bay, Unnamed Tributary to Black Creek)	see FIRM	see FIRM	USGS regional regression equations for State of Georgia, FLO-2D version 2009.06 Build 09-11.08.07	FLO-2D version 2009.06 Build 09-11.08.07	2014		unsteady two-dimensional (2D) analysis, 100 foot cell size. WSELs estimated using the slope-area method (normal depth)
Miscellaneuos Approximate Streams; (Cowpen Branch, Dasher Creek, Dasher Creek Tributary 2, Deep Branch, Runs Branch, Groover Branch, Hardin Swamp, Hungleiter Branch, Keiffer Branch, Little Ebenezer Creek, Mill Creek, Mill Creek Tributary 1)	see FIRM	see FIRM	USGS regional regression equations for State of Georgia	HEC-RAS, version 4.1.0 (HEC, 2010a)	2014		USGS gage station 02198690 Ebenezer Creek at Springfield, GA was used for Runs Branch. Peak discharges were estimated based on methodologies describe on SIR 2009-5043 (USGS, 2009a); and USGS SIR 2011-5042, (USGS, 2011a), (NARSAL, 2011)

Table 13: Summary of Hydrologic and Hydraulic Analyses - continued

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Miscellaneuos Approximate Streams – continued; (Ogeechee River Tributary 1, Ogeechee River Tributary 1.1, Ogeechee River Tributary 2, Little Ogeechee River, Runs Branch Tributary 1, Runs Branch Tributary 1.1, Runs Branch Tributary 2, Savannah River, Savannah River Tributary 1, Savannah River Tributary 2, Savannah River Tributary 3, Savannah River Tributary 4)	see FIRM	see FIRM	USGS regional regression equations for State of Georgia	HEC-RAS, version 4.1.0 (HEC, 2010a)	2014		USGS gage station 02198690 Ebenezer Creek at Springfield, GA was used for Runs Branch. Peak discharges were estimated based on methodologies describe on SIR 2009-5043 (USGS, 2009a); and USGS SIR 2011-5042, (USGS, 2011a), (NARSAL, 2011)

Table 13: Summary of Hydrologic and Hydraulic Analyses - continued

Flooding Source	Study Limits Downstream Limit	Study Limits Upstream Limit	Hydrologic Model or Method Used	Hydraulic Model or Method Used	Date Analyses Completed	Flood Zone on FIRM	Special Considerations
Miscellaneuos Approximate Streams – continued; (Savannah River Tributary 5, Savannah River Tributary 6, Shrimp Creek, Shrimp Creek Tributary 3, Shrimp Creek Tributary 4, Shrimp Creek Tributary 5, Stillwell Branch, Sweigoffer Creek, Turkey Branch, Turkey Branch Tributary 1, Turkey Branch Tributary 2, Turkey Branch Tributary 3, Unnamed Tributary to Black Creek, Walden Branch)	see FIRM	see FIRM	USGS regional regression equations for State of Georgia	HEC-RAS, version 4.1.0 (HEC, 2010a)	2014		USGS gage station 02198690 Ebenezer Creek at Springfield, GA was used for Runs Branch. Peak discharges were estimated based on methodologies describe on SIR 2009-5043 (USGS, 2009a); and USGS SIR 2011-5042, (USGS, 2011a), (NARSAL, 2011)

Table 14: Roughness Coefficients

Flooding Source	Channel “n”	Overbank “n”
Black Creek	*	*
Dasher Creek	0.04	0.15
Horning Swamp	0.025-0.07	0.025-0.1
Jacks Creek	0.04	0.08
Little Ogeechee River	0.025-0.07	0.025-0.1
Little Ogeechee River Convergence	*	*
Little Ogeechee River Divergence	*	*
Little Ogeechee River Tributary 1	*	*
Ogeechee River	0.025-0.07	0.025-0.1
Polly Creek	*	*
Rincon Creek	0.025-0.07	0.025-0.1
Runs Branch	0.04	0.08
Snooks Branch	0.04	0.08
St. Augustine Creek	*	*
Sweigoffer Creek	0.04	0.15
Unnamed Tributary to Black Creek	*	*
White Deer Branch	0.04	0.08
Willowpeg Creek	0.025-0.07	0.025-0.1

5.3 Coastal Analyses

This section is not applicable to this Flood Risk Project.

Table 15: Summary of Coastal Analyses

[Not Applicable to this Flood Risk Project]

5.3.1 Total Stillwater Elevations

This section is not applicable to this Flood Risk Project.

Figure 8: 1% Annual Chance Total Stillwater Elevations for Coastal Areas

[Not Applicable to this Flood Risk Project]

Table 16: Tide Gage Analysis Specifics

[Not Applicable to this Flood Risk Project]

5.3.2 Waves

This section is not applicable to this Flood Risk Project.

5.3.3 Coastal Erosion

This section is not applicable to this Flood Risk Project.

5.3.4 Wave Hazard Analyses

This section is not applicable to this Flood Risk Project.

Table 17: Coastal Transect Parameters

[Not Applicable to this Flood Risk Project]

Figure 9: Transect Location Map

[Not applicable to this Flood Risk Project]

5.4 Alluvial Fan Analyses

This section is not applicable to this Flood Risk Project.

Table 18: Summary of Alluvial Fan Analyses

[Not applicable to this Flood Risk Project]

Table 19: Results of Alluvial Fan Analyses

[Not applicable to this Flood Risk Project]

SECTION 6.0 – MAPPING METHODS

6.1 Vertical and Horizontal Control

All FIS Reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum used for newly created or revised FIS Reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the completion of the North American Vertical Datum of 1988 (NAVD88), many FIS Reports and FIRMs are now prepared using NAVD88 as the referenced vertical datum.

Flood elevations shown in this FIS Report and on the FIRMs are referenced to NAVD88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between NGVD29 and NAVD88 or other datum conversion, visit the National Geodetic Survey website at www.ngs.noaa.gov, or contact the National Geodetic Survey (NGS) at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the archived project documentation associated with the FIS Report and the FIRMs for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description, and/or location information for benchmarks in the area, please contact the information services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

The datum conversion locations and values that were calculated for Effingham County are provided in Table 20.

Table 20: Countywide Vertical Datum Conversion

Quadrangle Name	Quadrangle Corner	Latitude	Longitude	Conversion from NGVD29 to NAVD88 (feet)
Blue Springs Landing	SE	32.625	-81.375	-0.873
Oliver	SE	32.5	-81.5	-0.817
Kildare	SE	32.5	-81.375	-0.86
Brighton	SE	32.5	-81.25	-0.906
Leefield	SE	32.375	-81.5	-0.804
Egypt	SE	32.375	-81.375	-0.853
Springfield North	SE	32.375	-81.25	-0.912
Hardeeville NW	SE	32.375	-81.125	-0.915
Guyton	SE	32.25	-81.375	-0.856
Springfield South	SE	32.25	-81.25	-0.915
Rincon	SE	32.25	-81.125	-0.915
Eden	SE	32.125	-81.375	-0.853
Average Conversion from NGVD29 to NAVD88 = -0.873 feet				

Table 21: Stream-Based Vertical Datum Conversion

[Not applicable to this Flood Risk Project]

6.2 Base Map

The FIRMs and FIS Report for this project have been produced in a digital format. The flood hazard information was converted to a Geographic Information System (GIS) format that meets FEMA's FIRM database specifications and geographic information standards. This information is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community. The FIRM Database includes most of the tabular information contained in the FIS Report in such a way that the data can be associated with pertinent spatial features. For example, the information contained in the Floodway Data table and Flood Profiles can be linked to the cross sections that are shown on the FIRMs. Additional information about the FIRM Database and its contents can be found in FEMA's *Guidelines and Standards for Flood Risk Analysis and Mapping*, www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping.

Base map information shown on the FIRM was derived from the sources described in Table 22.

Table 22: Base Map Sources

Data Type	Data Provider	Data Date	Data Scale	Data Description
Digital Orthophotography	Fugro EarthData, Inc	February 2008 or later	1:1,200	Digital Orthophotography
Digital Orthophotography	Effingham County GIS Department	2008 or later	1"=200	Digital Orthophotography
County Boundaries	Georgia Department of Transportation	12/09/2009	1:100,000	

6.3 Floodplain and Floodway Delineation

The FIRM shows tints, screens, and symbols to indicate floodplains and floodways as well as the locations of selected cross sections used in the hydraulic analyses and floodway computations.

For riverine flooding sources, the mapped floodplain boundaries shown on the FIRM have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using the topographic elevation data described in Table 23.

In cases where the 1% and 0.2% annual chance floodplain boundaries are close together, only the 1% annual chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

The floodway widths presented in this FIS Report and on the FIRM were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. **Error! Reference source not found.** indicates the flooding sources for which floodways have been determined. The results of the floodway computations for those flooding sources have been tabulated for selected cross sections and are shown in Table 24, "Floodway Data."

Certain flooding sources may have been studied that do not have published BFEs on the FIRMs, or for which there is a need to report the 1% annual chance flood elevations at selected cross sections because a published Flood Profile does not exist in this FIS Report. These streams may have also been studied using methods to determine non-encroachment zones rather than floodways. For these flooding sources, the 1% annual chance floodplain boundaries have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using the topographic elevation data described in Table 23. All topographic data used for modeling or mapping has been converted as necessary to NAVD88. The 1% annual chance elevations for selected cross sections along these flooding sources, along with their non-encroachment widths, if calculated, are shown in Table 25, "Flood Hazard and Non-Encroachment Data for Selected Streams."

Table 23: Summary of Topographic Elevation Data used in Mapping

Community	Flooding Source	Source for Topographic Elevation Data					
		Description	Scale	Contour Interval	$RMSE_z$	$Accuracy_z$	Citation
Effingham County	Miscellaneous within Effingham County	Light Detection and Ranging data (LiDAR)	N/A	1 ft	N/A	N/A	Coastal Georgia Regional Center and the South Carolina LiDAR Consortium
Effingham County, Unincorporated Areas	Black Creek, Unnamed Tributary to Black Creek	Topographic maps	1:12,000	1 ft	N/A	N/A	Thomas and Hutton Engineering Co. 2003
Effingham County	Miscellaneous (between cross sections) within Effingham County	DEM	10-meter	N/A	N/A	N/A	USGS 2009c

BFEs shown at cross sections on the FIRM represent the 1% annual chance water surface elevations shown on the Flood Profiles and in the Floodway Data tables in the FIS Report. Rounded whole-foot elevations may be shown on the FIRM in coastal areas, areas of ponding, and other areas with static base flood elevations.

Table 24: Floodway Data

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	0	160	563	3.1	26.3	26.3	26.9	0.6
B	2,817	120	263	3.8	30.2	30.2	30.5	0.3
C	3,562	165	791	1.3	33.6	33.6	33.6	0.0
D	5,973	140	294	3.4	35.1	35.1	35.5	0.4
E	6,896	115	373	2.7	36.9	36.9	37.3	0.4
F	7,873	120	337	2.9	37.8	37.8	38.4	0.6
G	12,433	115	310	3.2	45.9	45.9	46.3	0.4
H	13,368	160	367	2.7	48.4	48.4	48.9	0.5
I	13,833	170	715	1.4	51.1	51.1	51.6	0.5
J	15,191	150	341	2.9	52.1	52.1	52.5	0.4
K	16,012	115	364	2.7	53.4	53.4	53.7	0.3
L	17,360	125	304	3.3	56.4	56.4	56.9	0.5
M	17,799	170	603	1.6	58.0	58.0	58.3	0.3
N	23,888	100	430	2.3	64.4	64.4	65.2	0.8
O	27,765	115	420	2.6	67.5	67.5	68.0	0.5
P	28,807	160	857	1.2	71.0	71.0	71.1	0.1
Q	31,745	195	962	1.0	73.2	73.2	74.1	0.9

[1]Feet above Limit of Detailed Study (Limit of Detailed Study is approximately 3,300 feet downstream of Mill Pond Road)

Table 25: Flood Hazard and Non-Encroachment Data for Selected Streams

[Not applicable to this Flood Risk Project]

6.4 Coastal Flood Hazard Mapping

This section is not applicable to this Flood Risk Project.

Table 26: Summary of Coastal Transect Mapping Considerations

[Not applicable to this Flood Risk Project]

6.5 FIRM Revisions

This FIS Report and the FIRM are based on the most up-to-date information available to FEMA at the time of its publication; however, flood hazard conditions change over time. Communities or private parties may request flood map revisions at any time. Certain types of requests require submission of supporting data. FEMA may also initiate a revision. Revisions may take several forms, including Letters of Map Amendment (LOMAs), Letters of Map Revision Based on Fill (LOMR-Fs), Letters of Map Revision (LOMRs) (referred to collectively as Letters of Map Change (LOMCs)), Physical Map Revisions (PMRs), and FEMA-contracted restudies. These types of revisions are further described below. Some of these types of revisions do not result in the republishing of the FIS Report. To assure that any user is aware of all revisions, it is advisable to contact the community repository of flood-hazard data (shown in Table 31, "Map Repositories").

6.5.1 Letters of Map Amendment

A LOMA is an official revision by letter to an effective NFIP map. A LOMA results from an administrative process that involves the review of scientific or technical data submitted by the owner or lessee of property who believes the property has incorrectly been included in a designated SFHA. A LOMA amends the currently effective FEMA map and establishes that a specific property is not located in an SFHA. **A LOMA cannot be issued for properties located on the PFD (primary frontal dune).**

To obtain an application for a LOMA, visit www.fema.gov/floodplain-management/letter-map-amendment-loma and download the form "MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill". Visit the "Flood Map-Related Fees" section to determine the cost, if any, of applying for a LOMA.

FEMA offers a tutorial on how to apply for a LOMA. The LOMA Tutorial Series can be accessed at www.fema.gov/online-tutorials.

For more information about how to apply for a LOMA, call the FEMA Map Information eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627).

6.5.2 Letters of Map Revision Based on Fill

A LOMR-F is an official revision by letter to an effective NFIP map. A LOMR-F states FEMA's determination concerning whether a structure or parcel has been elevated on fill above the base flood elevation and is, therefore, excluded from the SFHA.

Information about obtaining an application for a LOMR-F can be obtained in the same manner as that for a LOMA, by visiting www.fema.gov/floodplain-management/letter-map-amendment-loma for the "MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill" or by calling the FEMA Map Information eXchange, toll free, at 1-877-FEMA MAP (1-877-336-2627). Fees for applying for a LOMR-F, if any, are listed in the "Flood Map-Related Fees" section.

A tutorial for LOMR-F is available at www.fema.gov/online-tutorials.

6.5.3 Letters of Map Revision

A LOMR is an official revision to the currently effective FEMA map. It is used to change flood zones, floodplain and floodway delineations, flood elevations and planimetric features. All requests for LOMRs should be made to FEMA through the chief executive officer of the community, since it is the community that must adopt any changes and revisions to the map. If the request for a LOMR is not submitted through the chief executive officer of the community, evidence must be submitted that the community has been notified of the request.

To obtain an application for a LOMR, visit www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/mt-2-application-forms-and-instructions and download the form "MT-2 Application Forms and Instructions for Conditional Letters of Map Revision and Letters of Map Revision". Visit the "Flood Map-Related Fees" section to determine the cost of applying for a LOMR. For more information about how to apply for a LOMR, call the FEMA Map Information eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627) to speak to a Map Specialist.

Previously issued mappable LOMCs (including LOMRs) that have been incorporated into the Effingham County FIRM are listed in Table 27. Please note that this table only includes LOMCs that have been issued on the FIRM panels updated by this map revision. For all other areas within this county, users should be aware that revisions to the FIS Report made by prior LOMRs may not be reflected herein and users will need to continue to use the previously issued LOMRs to obtain the most current data.

Table 27: Incorporated Letters of Map Change

Case Number	Effective Date	Flooding Source	FIRM Panel(s)
07-04-6193P[1]	12/27/2007	Exley Tract	
95-04-301P[1]	08/15/1995	Restudy of Ogeechee River	

[1] Previously incorporated into the December 17, 2010 initial countywide study.

6.5.4 Physical Map Revisions

Physical Map Revisions (PMRs) are an official republication of a community's NFIP map to effect changes to base flood elevations, floodplain boundary delineations, regulatory floodways and planimetric features. These changes typically occur as a result of structural works or improvements, annexations resulting in additional flood hazard areas or correction to base flood elevations or SFHAs.

The community's chief executive officer must submit scientific and technical data to FEMA to support the request for a PMR. The data will be analyzed and the map will be revised if warranted. The community is provided with copies of the revised information and is afforded a review period. When the base flood elevations are changed, a 90-day appeal period is provided. A 6-month adoption period for formal approval of the revised map(s) is also provided.

For more information about the PMR process, please visit www.fema.gov and visit the "Flood Map Revision Processes" section.

6.5.5 Contracted Restudies

The NFIP provides for a periodic review and restudy of flood hazards within a given community. FEMA accomplishes this through a national watershed-based mapping needs assessment strategy, known as the Coordinated Needs Management Strategy (CNMS). The CNMS is used by FEMA to assign priorities and allocate funding for new flood hazard analyses used to update the FIS Report and FIRM. The goal of CNMS is to define the validity of the engineering study data within a mapped inventory. The CNMS is used to track the assessment process, document engineering gaps and their resolution, and aid in prioritization for using flood risk as a key factor for areas identified for flood map updates. Visit www.fema.gov to learn more about the CNMS or contact the FEMA Regional Office listed in Section 8 of this FIS Report.

6.5.6 Community Map History

The current FIRM presents flooding information for the entire geographic area of Effingham County. Previously, separate FIRMs, Flood Hazard Boundary Maps (FHBMs) and/or Flood Boundary and Floodway Maps (FBFMs) may have been prepared for the incorporated communities and the unincorporated areas in the county that had identified SFHAs. Current and historical data relating to the maps prepared for the project area are presented in Table 28, "Community Map History." A description of each of the column headings and the source of the date is also listed below.

- *Community Name* includes communities falling within the geographic area shown on the FIRM, including those that fall on the boundary line, nonparticipating communities, and communities with maps that have been rescinded. Communities with No Special Flood Hazards are indicated by a footnote. If all maps (FHBM, FBFM, and FIRM) were rescinded for a community, it is not listed in this table unless SFHAs have been identified in this community.

- *Initial Identification Date (First NFIP Map Published)* is the date of the first NFIP map that identified flood hazards in the community. If the FHBM has been converted to a FIRM, the initial FHBM date is shown. If the community has never been mapped, the upcoming effective date or "pending" (for Preliminary FIS Reports) is shown. If the community is

listed in Table 28 but not identified on the map, the community is treated as if it were unmapped.

- *Initial FHBM Effective Date* is the effective date of the first Flood Hazard Boundary Map (FHBM). This date may be the same date as the Initial NFIP Map Date.

- *FHBM Revision Date(s)* is the date(s) that the FHBM was revised, if applicable.

- *Initial FIRM Effective Date* is the date of the first effective FIRM for the community.

- *FIRM Revision Date(s)* is the date(s) the FIRM was revised, if applicable. This is the revised date that is shown on the FIRM panel, if applicable. As countywide studies are completed or revised, each community listed should have its FIRM dates updated accordingly to reflect the date of the countywide study. Once the FIRMs exist in countywide format, as Physical Map Revisions (PMR) of FIRM panels within the county are completed, the FIRM Revision Dates in the table for each community affected by the PMR are updated with the date of the PMR, even if the PMR did not revise all the panels within that community.

The initial effective date for the Effingham County FIRMs in countywide format was December 17, 2010.

Table 28: Community Map History

Community Name	Initial Identification Date	Initial FHBM Effective Date	FHBM Revision Date(s)	Initial FIRM Effective Date	FIRM Revision Date(s)
Effingham County, Unincorporated Areas	06/02/1978	06/02/1978	N/A	03/18/1987	09/03/1992 12/17/2010 03/16/2015
Guyton, City of	07/01/1977	07/01/1977	06/01/2005	06/01/2005	12/17/2010 03/16/2015
Rincon, City of	04/11/1975	04/11/1975	N/A	02/19/1987	12/17/2010 03/16/2015
Springfield, City of	04/04/1975	04/04/1975	09/08/1978	03/18/1987	12/17/2010 03/16/2015

SECTION 7.0 – CONTRACTED STUDIES AND COMMUNITY COORDINATION

7.1 Contracted Studies

Table 29 provides a summary of the contracted studies, by flooding source, that are included in this FIS Report

Table 29: Summary of Contracted Studies Included in this FIS Report

Flooding Source	FIS Report Dated	Contractor	Number	Work Completed Date	Affected Communities
Birds Branch	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas
Black Creek	3/18/1987	USACE, Savannah District	Not Available	1976	Effingham County, Unincorporated Areas
Black Creek	12/17/2010	Atkins North America, Inc.	EMA-2008-CA-5870	June 2009	Effingham County, Unincorporated Areas
Coldbrook Swamp	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Not Available
Dasher Creek	2/19/1987	USACE, Savannah District	Not Available	1976	Rincon, City of
Dasher Creek	3/18/1987	USACE, Savannah District	Not Available	1976	Effingham County, Unincorporated Areas
Dasher Creek	12/17/2010	Watershed Concepts	DACW21-01-D-0004, Task Order No. 8	November 2004	Effingham County, Unincorporated Areas; Rincon, City of
Dasher Creek	12/17/2010	Atkins North America, Inc.	EMA-2008-CA-5870	June 2009	Effingham County, Unincorporated Areas; Rincon, City of
Dasher Creek	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas; Rincon, City of
Horning Swamp	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas
Jacks Branch	3/18/1987	USACE, Savannah District	Not Available	1976	Effingham County, Unincorporated Areas; Springfield, City of
Jacks Branch	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas; Springfield, City of
Little Ogeechee River	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas

Table29: Summary of Contracted Studies Included in this FIS Report - continued

Flooding Source	FIS Report Dated	Contractor	Number	Work Completed Date	Affected Communities
Little Ogeechee River Convergence	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas
Little Ogeechee River Divergence	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas
Little Ogeechee River Tributary 1	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas
Lockner Creek	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas
Lockner Creek Tributary 1	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas
Ogeechee River	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas
Polly Creek	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas; Rincon, City of
Rincon Branch	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas; Rincon, City of
Runs Branch	3/18/1987	USACE, Savannah District	Not Available	1976	Effingham County, Unincorporated Areas; Springfield, City of
Runs Branch	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas; Springfield, City of
Snooks Branch	3/18/1987	USACE, Savannah District	Not Available	1976	Springfield, City of
Snooks Branch	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Springfield, City of

Table29: Summary of Contracted Studies Included in this FIS Report - continued

Flooding Source	FIS Report Dated	Contractor	Number	Work Completed Date	Affected Communities
St. Augustine Creek	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas
Sweigoffer Creek	2/19/1987	USACE, Savannah District	Not Available	1976	Rincon, City of
Sweigoffer Creek	3/18/1987	USACE, Savannah District	Not Available	1976	Effingham County, Unincorporated Areas
Sweigoffer Creek	12/17/2010	Watershed Concepts	DACW21-01-D-0004, Task Order No. 8	November 2004	Effingham County, Unincorporated Areas; Rincon, City of
Sweigoffer Creek	12/17/2010	Atkins North America, Inc.	EMA-2008-CA-5870	June 2009	Effingham County, Unincorporated Areas; Rincon, City of
Sweigoffer Creek	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas; Rincon, City of
Three Men Swamp	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas
Unnamed Tributary to Black Creek	12/17/2010	Atkins North America, Inc.	EMA-2008-CA-5870	June 2009	Effingham County, Unincorporated Areas
White Deer Branch	3/18/1987	USACE, Savannah District	Not Available	1976	Effingham County, Unincorporated Areas; Springfield, City of
White Deer Branch	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas; Springfield, City of
Willowpeg Creek	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Effingham County, Unincorporated Areas; Rincon, City of
Miscellaneous Approximate Study Streams	3/16/2015	Atkins North America, Inc.	EMA-2010-CA-5087	July 2012	Miscellaneous

7.2 Community Meetings

The dates of the community meetings held for this Flood Risk Project and previous Flood Risk Projects are shown in Table 30. These meetings may have previously been referred to by a variety of names (Community Coordination Officer (CCO), Scoping, Discovery, etc.), but all meetings represent opportunities for FEMA, community officials, study contractors, and other invited guests to discuss the planning for and results of the project.

Table 30: Community Meetings

Community	FIS Report Dated	Date of Meeting	Meeting Type	Attended By
Effingham County	10/30/2015	08/19/2015	Work Map	FEMA, Georgia DNR, CDM Smith, and community officials
Effingham County	03/16/2015	11/09/2010	CCO Meeting	FEMA, Coastal Georgia Regional Commission (CGRC), and the affected communities
		04/17/2012	Scoping	Atkins, AECOM, CDM Smith, FEMA, and Georgia DNR
		12/07/2012	CCO Meeting	FEMA, Georgia DNR, Coastal Regional Commission, Atkins, and the communities
Effingham County	12/17/2010		CCO Meeting	FEMA, Georgia DNR, Atkins, and the communities
		10/15/2009	CCO Meeting	FEMA, Georgia DNR, Atkins, and the communities
Effingham County Unincorporated Areas	09/03/1992	04/14/1986	CCO Meeting	FEMA, the community, and the study contractor
Effingham County Unincorporated Areas	03/18/1987	Not Available	Not Available	Not Available
Rincon, City of	02/19/1987	11/18/1985	CCO Meeting	FEMA, the community, the study contractor, and USACE
Springfield, City of	03/18/1987	04/14/1986	CCO Meeting	FEMA, the community, the study contractor, and USACE

SECTION 8.0 – ADDITIONAL INFORMATION

Information concerning the pertinent data used in the preparation of this FIS Report can be obtained by submitting an order with any required payment to the FEMA Engineering Library. For more information on this process, see www.fema.gov.

The additional data that was used for this project includes the FIS Report and FIRM that were previously prepared for Effingham County (FEMA 2015).

Table 31 is a list of the locations where FIRMs for Effingham County can be viewed. Please note that the maps at these locations are for reference only and are not for distribution. Also, please note that only the maps for the community listed in the table are available at that particular repository. A user may need to visit another repository to view maps from an adjacent community.

Table 31: Map Repositories

Community	Address	City	State	Zip Code
Effingham County, Unincorporated Areas	Effingham County Administrative Complex 601 North Laurel Street	Springfield	GA	31329
Guyton, City of	City Hall 310 Central Boulevard	Guyton	GA	31312
Rincon, City of	City Hall 302 South Columbia Avenue	Rincon	GA	31326
Springfield, City of	City Hall 130 South Laurel Street	Springfield	GA	31329

The National Flood Hazard Layer (NFHL) dataset is a compilation of effective FIRM databases and LOMCs. Together they create a GIS data layer for a State or Territory. The NFHL is updated as studies become effective and extracts are made available to the public monthly. NFHL data can be viewed or ordered from the website shown in Table 32.

Table 32 contains useful contact information regarding the FIS Report, the FIRM, and other relevant flood hazard and GIS data. In addition, information about the State NFIP Coordinator and GIS Coordinator is shown in this table. At the request of FEMA, each Governor has designated an agency of State or territorial government to coordinate that State's or territory's NFIP activities. These agencies often assist communities in developing and adopting necessary floodplain management measures. State GIS Coordinators are knowledgeable about the availability and location of State and local GIS data in their state.

Table 32: Additional Information

FEMA and the NFIP	
FEMA and FEMA Engineering Library website	www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/engineering-library
NFIP website	www.fema.gov/national-flood-insurance-program

Table 32: Additional Information - continued

NFHL Dataset	msc.fema.gov
FEMA Region IV	Federal Emergency Management Agency, 3003 Chamblee Tucker Road, Atlanta, Georgia 30341
Other Federal Agencies	
USGS website	www.usgs.gov
Hydraulic Engineering Center website	www.hec.usace.army.mil
State Agencies and Organizations	
State NFIP Coordinator	Tom Shillock, CFM Dept. of Natural Resources Environmental Protection Division 2 Martin Luther King Jr. Drive Atlanta, Georgia 30334
State GIS Coordinator	Not Applicable

SECTION 9.0 – BIBLIOGRAPHY AND REFERENCES

Table 33 includes sources used in the preparation of and cited in this FIS Report as well as additional studies that have been conducted in the study area.

Table 33: Bibliography and References

Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
Atkins 2012a	Atkins North America, Inc.	*Effingham County, Georgia Hydrology Report*			May 2012	
Atkins 2012b	Atkins North America, Inc.	*Effingham County, Georgia, Hydraulics Report*			June 2012	
Atlanta Regional Commission 2001	Atlanta Regional Commission	*Georgia Stormwater Management Manual*			August 2001	
Coastal Georgia Regional Developme nt Center 2011	Coastal Georgia Regional Development Center	*Coastal Georgia Elevation Project*			2011	http://www.crc.ga.gov/gis/cgep/Forms/AllItems.aspx
Environmen tal Science Services Administrati on 1970	U.S. Department of Commerce	*Georgia Tropical Cyclones and Their Effect on the State, Technical Memorandum EDSTM 14*	Environmental Science Services Administration		January 1970	
FEMA 2015	Federal Emergency Management Agency	*Flood Insurance Study, Effingham County, Unincorporated Areas, Georgia*		Washington, D.C.	March 16, 2015	
FEMA 1983	Federal Emergency Management Agency	*Flood Insurance Study, Bryan County, Unincorporated Areas, Georgia*		Washington, D.C.	November 1983	

Table 33: Bibliography and References - continued

Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
FEMA 1987a	Federal Emergency Management Agency	*Flood Insurance Study, City of Rincon, Georgia, Effingham County*		Washington, D.C.	February 19, 1987	
FEMA 1987b	Federal Emergency Management Agency	*Flood Insurance Study, Effingham County, Unincorporated Areas, Georgia.*		Washington, D.C.	March 18, 1987	
FEMA 1987c	Federal Emergency Management Agency	*Flood Insurance Study, City of Springfield, Effingham County, Georgia*		Washington, D.C.	March 8, 1987	
FEMA 1992	Federal Emergency Management Agency	*Flood Insurance Study, Effingham County, Unincorporated Areas, Georgia*		Washington, D.C.	September 3, 1992	
FEMA 2010	Federal Emergency Management Agency	*Flood Insurance Study, Effingham County, Georgia and Incorporated Areas*		Washington, D.C.	December 17, 2010	
HEC 1984	Hydrologic Engineering Center	*HEC-2 Water Surface Profiles*		Davis, California	May 1984	
HEC 1987	Hydrologic Engineering Center	*HEC-1 Flood Hydrograph Package*		Davis, California	March 1987	

Table 33: Bibliography and References - continued

Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
HEC 2001	Hydrologic Engineering Center	*HEC-HMS Hydrologic Modeling System, Version 2.1*		Davis, California	January 2001	
HEC 2004	Hydrologic Engineering Center	*HEC-RAS River Analysis System*				
HEC 2008	Hydrologic Engineering Center	*HEC-RAS River Analysis System*				
HEC 2010a	Hydrologic Engineering Center	*HEC-RAS River Analysis System, Version 4.1.0*		Davis, California	January 2010	
HEC 2010b	Hydrologic Engineering Center	*HEC-HMS Hydrologic Modeling System, HEC-HMS 3.5*		Davis, California	August 10, 2010	
NGS 2009	National Geodetic Survey	*VERTCON-North American Vertical Datum Conversion Utility*			Retrieved March 12, 2009	http://www.ngs.noaa.gov/
Natural Resources Spatial Analysis Laboratory 2011	Natural Resources Spatial Analysis Laboratory	*Georgia Land Use Trends, 2008*			December 15, 2011	http://narsal.uga.edu
SCS 1986	Soil Conservation Service	*Urban Hydrology for Small Watersheds, Technical Release No. 55*			1986	

Table 33: Bibliography and References - continued

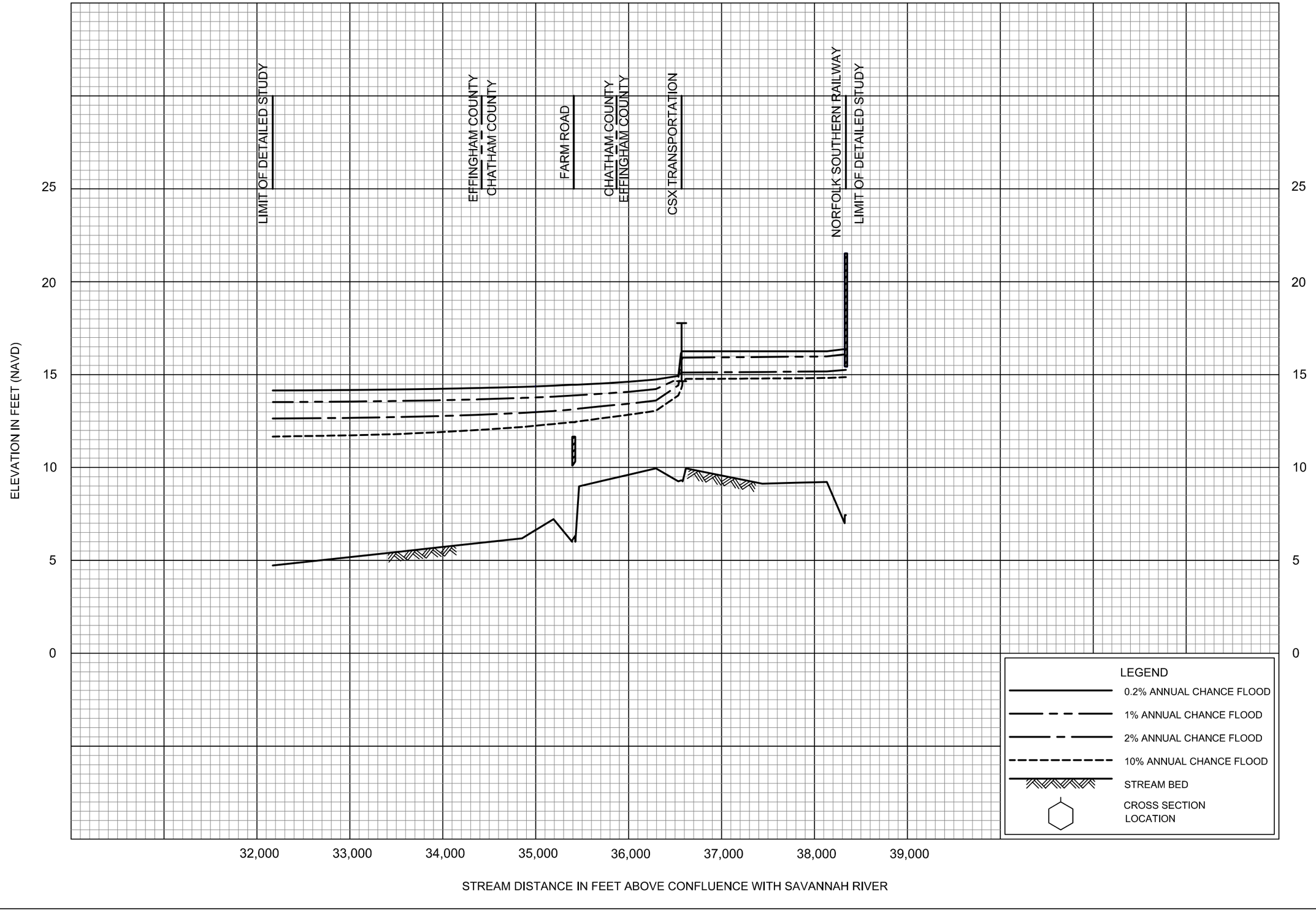
Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
South Carolina LiDAR Consortium 2011	South Carolina LiDAR Consortium	*LiDAR Data, Contour Interval 1 Foot: Jasper and Hampton Counties, South Carolina*			2011	
Stamey, T.C. and C.W. Hess 1993	Stamey, T.C. and C.W. Hess	*Techniques for Estimating Magnitude and Frequency of Floods in Rural Basins of Georgia*	Stamey, T.C. and C.W. Hess		1993	
USACE 1976a	U.S. Army Corps of Engineers	*Flood Plain Information, Dasher, Sweigoffer and Polly Creeks, Rincon, Georgia*		Savannah District	April 1976	
USACE 1976b	U.S. Army Corps of Engineers	*Flood Plain Information, Ebenezer Creek and Tributaries, Springfield, Georgia*		Savannah District	April 1976	
U.S. Census Bureau 2012	U.S. Census Bureau	*American Fact Finder & County Quickfacts, Effingham County, Georgia, 2010*			Retrieved September 17, 2012	http://www.quickfacts.census.gov
USGS 1979	U.S. Geological Survey	*Floods in Georgia, Magnitude and Frequency, Water Resources Investigations 78-137*		Doraville, Georgia	October 1979	
USGS 987	U.S. Geological Survey	*Simulation of Flood Hydrographs for Georgia Streams, Water-Supply Paper 2317*			1987	

Table 33: Bibliography and References - continued

Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
USGS 2009a	U.S. Geological Survey	*Magnitude and Frequency of Rural Floods in the Southeastern United States, 2006: Volume I, Georgia, Scientific Investigations Report 2009-5043*			2009	
USGS 2009b	U.S. Geological Survey	*Techniques for Estimating the Magnitude and Frequency of Floods in Rural Basins of South Carolina, Water-Resources Investigation Report 2009-5156*			2009	
USGS 2009c	U.S. Geological Survey	*Seamless Data Distribution System – 10-meter Digital Elevation Model*			Downloaded March 2009	http://seamless.usgs.gov/
USGS 2011a	U.S. Geological Survey	*Magnitude and Frequency of Floods for Urban and Small Rural Streams in Georgia, 2008, Scientific Investigations Report 2011-5042*			2011	
USGS 2011b	U.S. Geological Survey	*National Elevation Dataset, 2010*			Retrieved December 2011	http://seamless.usgs.gov/ned13.php (1/3 arc-second NHD topography

Table 33: Bibliography and References - continued

Citation in this FIS	Publisher/ Issuer	*Publication Title,* "Article," Volume, Number, etc.	Author/Editor	Place of Publication	Publication Date/ Date of Issuance	Link
Thomas and Hutton Engineering Company 2003	Thomas and Hutton Engineering Company	*Effingham County, GA LiDAR, Scale 1:12,000*			2003	
Watershed Concepts 2004	Watershed Concepts	*Effingham County Stormwater Study, Effingham County, Georgia, U.S. Army Corps of Engineers, Savannah District*		Savannah District	November 2004	
The Weather Channel 2012	The Weather Channel	*Monthly Averages for Springfield, Georgia*			Retrieved on September 17, 2012	http://www.weather.com



FLOOD PROFILES

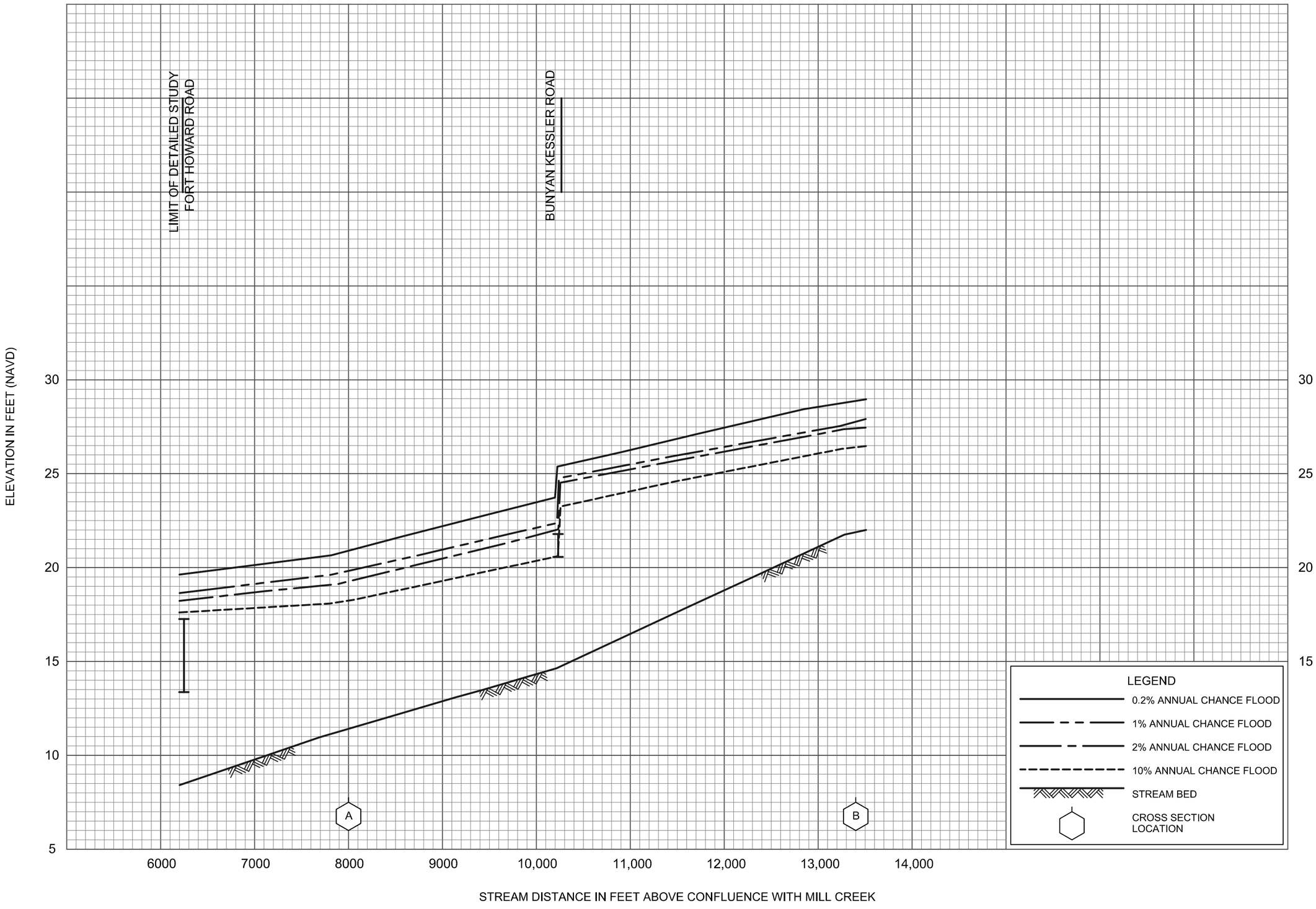
BLACK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

01P



FLOOD PROFILES

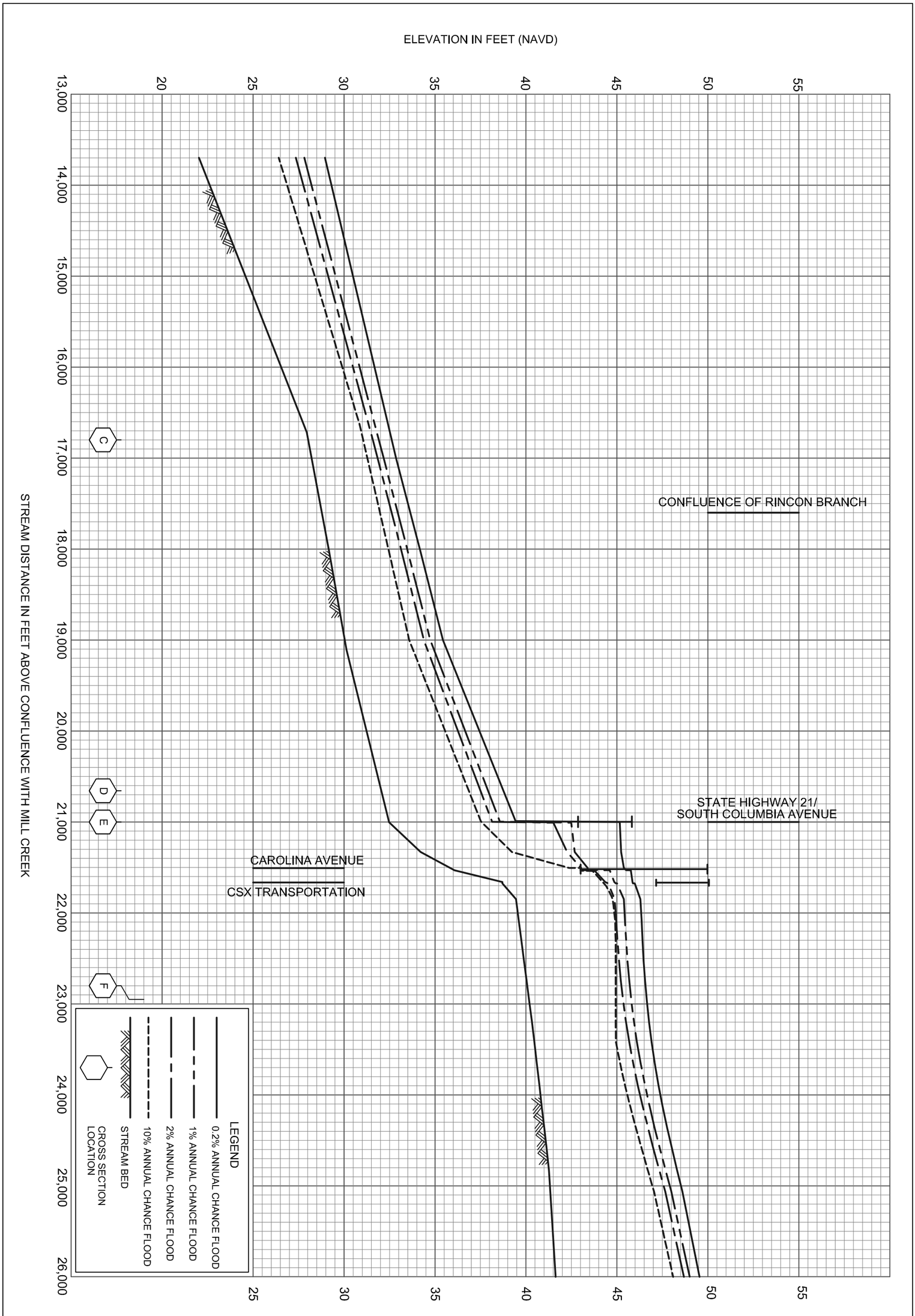
DASHER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

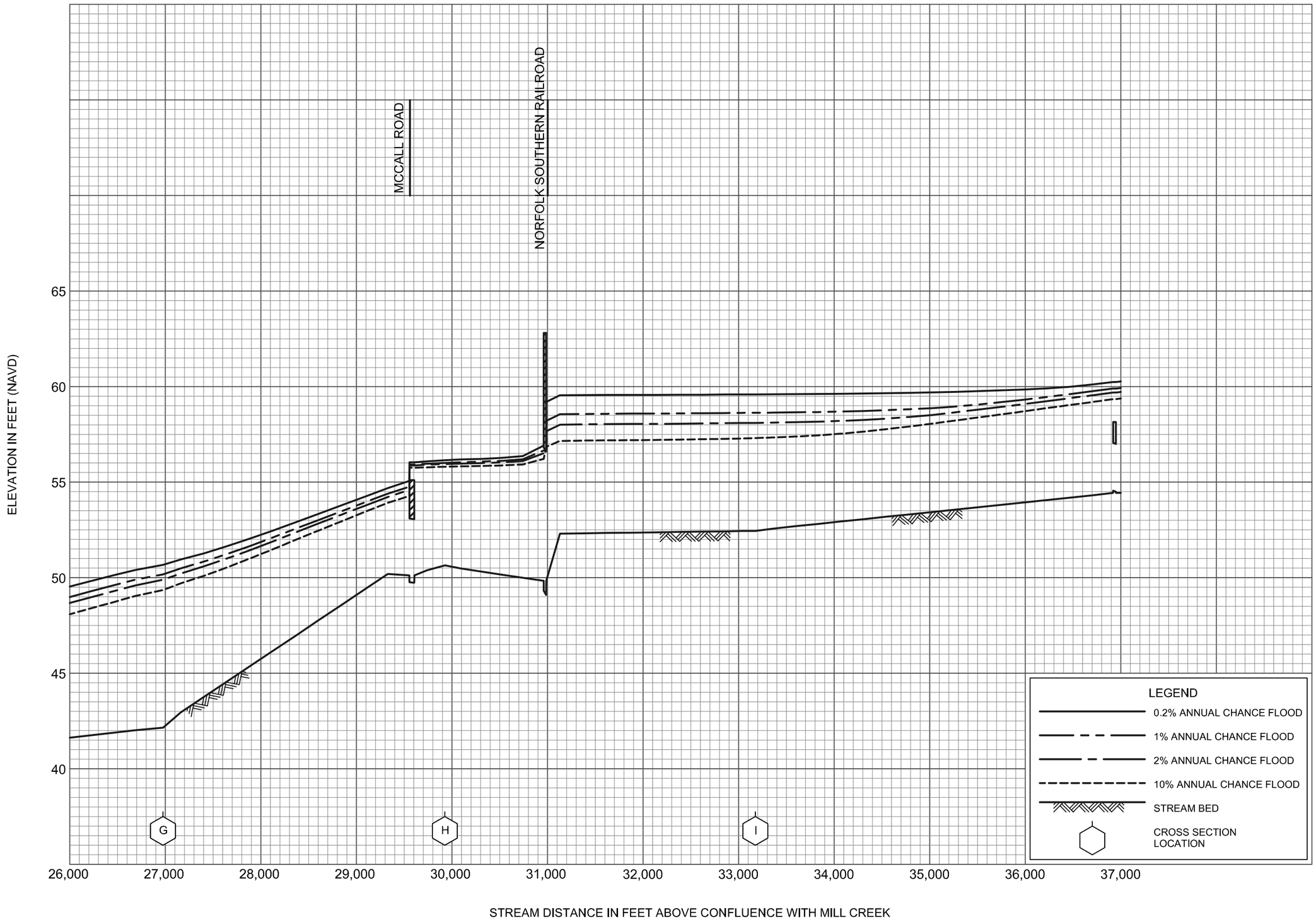
EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

02P



03P	FEDERAL EMERGENCY MANAGEMENT AGENCY EFFINGHAM COUNTY, GA AND INCORPORATED AREAS	FLOOD PROFILES DASHER CREEK



FLOOD PROFILES

DASHER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

04P

ELEVATION IN FEET (NAVD)

LIMIT OF DETAILED STUDY

65
60
55
50

37,000
38,000
39,000
40,000
41,000

J
K
L

LEGEND

- 0.2% ANNUAL CHANCE FLOOD
- 1% ANNUAL CHANCE FLOOD
- 2% ANNUAL CHANCE FLOOD
- 10% ANNUAL CHANCE FLOOD
- STREAM BED
- CROSS SECTION LOCATION

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH MILL CREEK

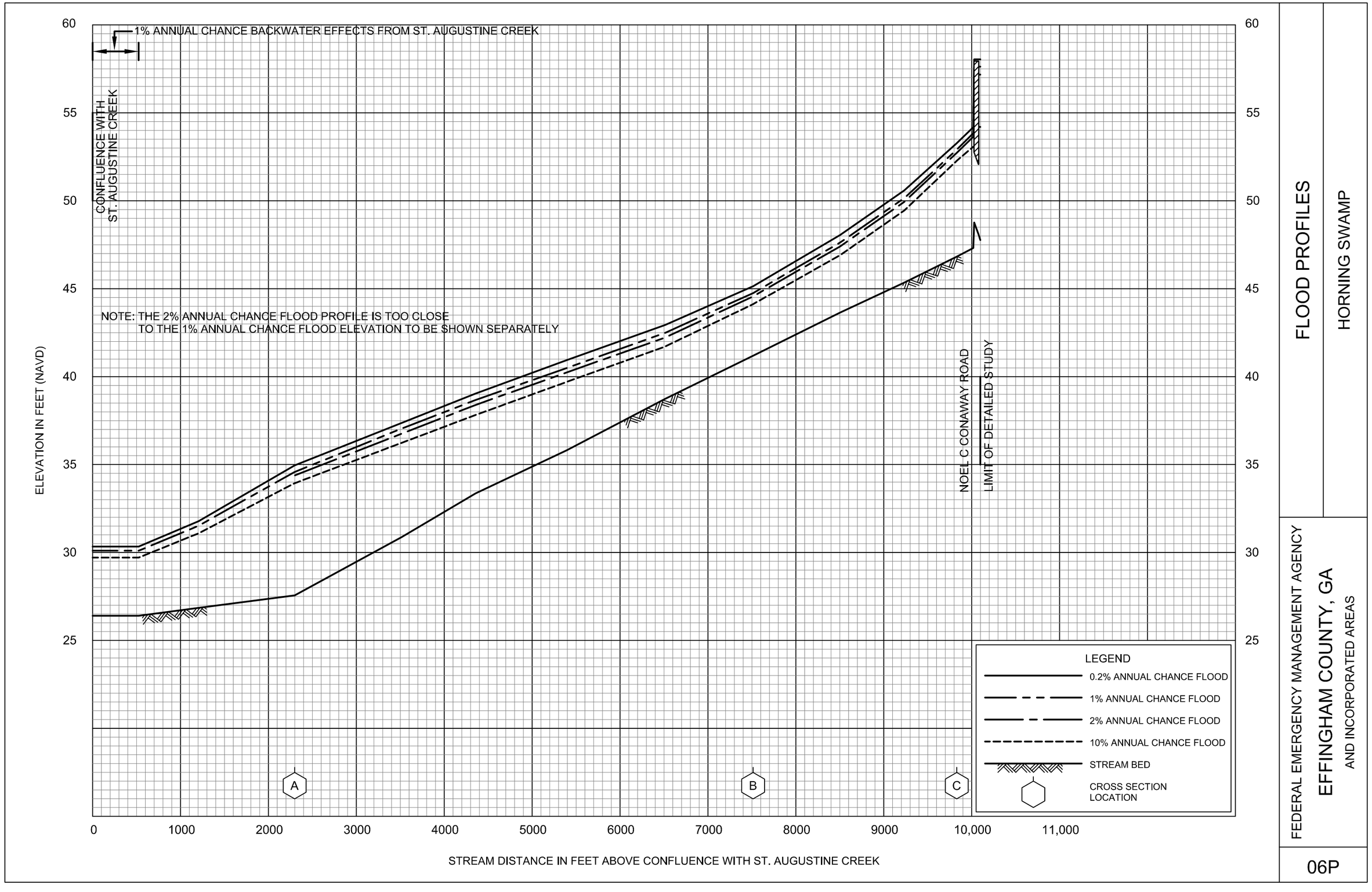
FLOOD PROFILES

DASHER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS



FLOOD PROFILES

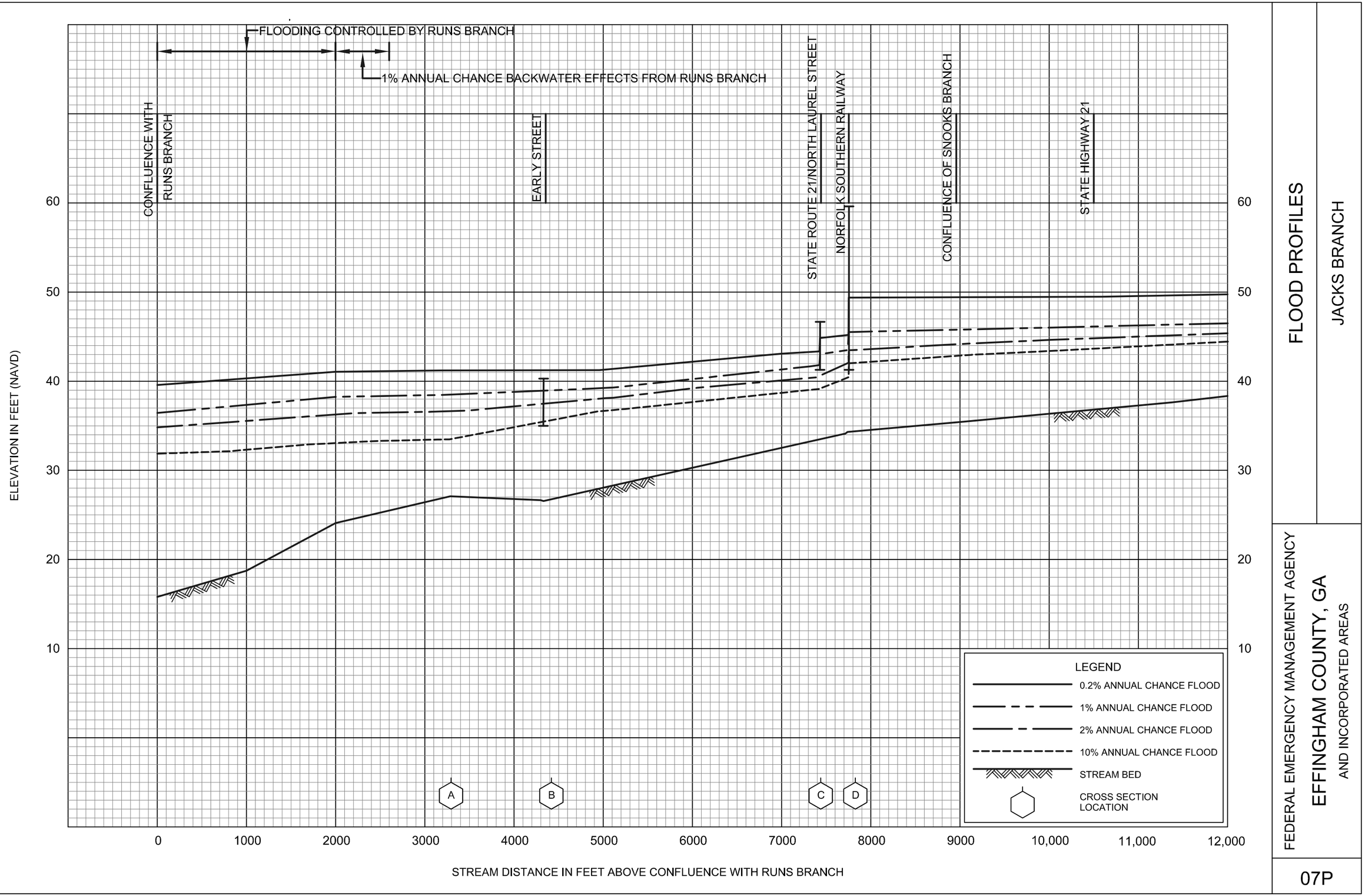
HORNING SWAMP

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

06P



FLOOD PROFILES

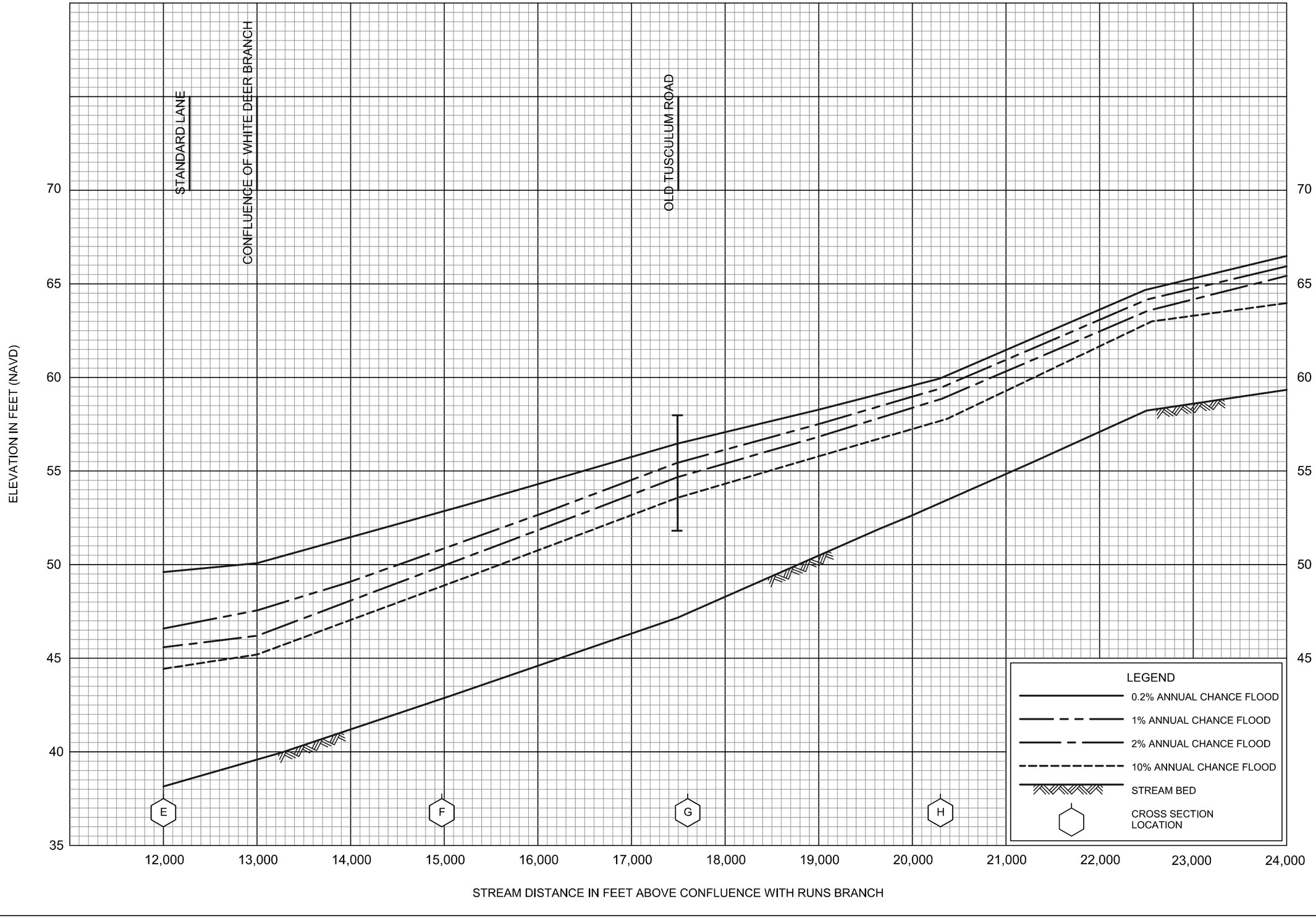
JACKS BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

07P



FLOOD PROFILES

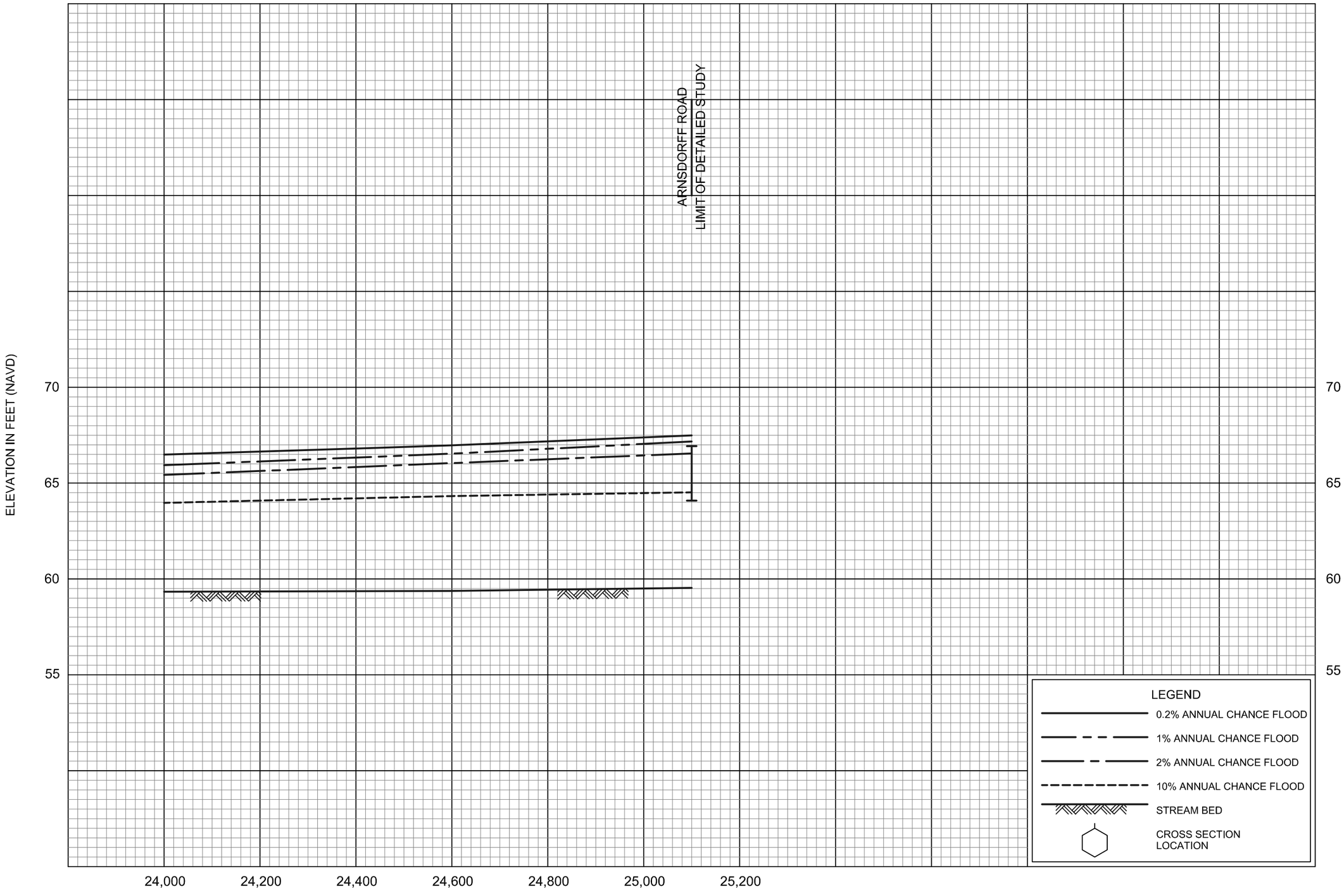
JACKS BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

08P



FLOOD PROFILES

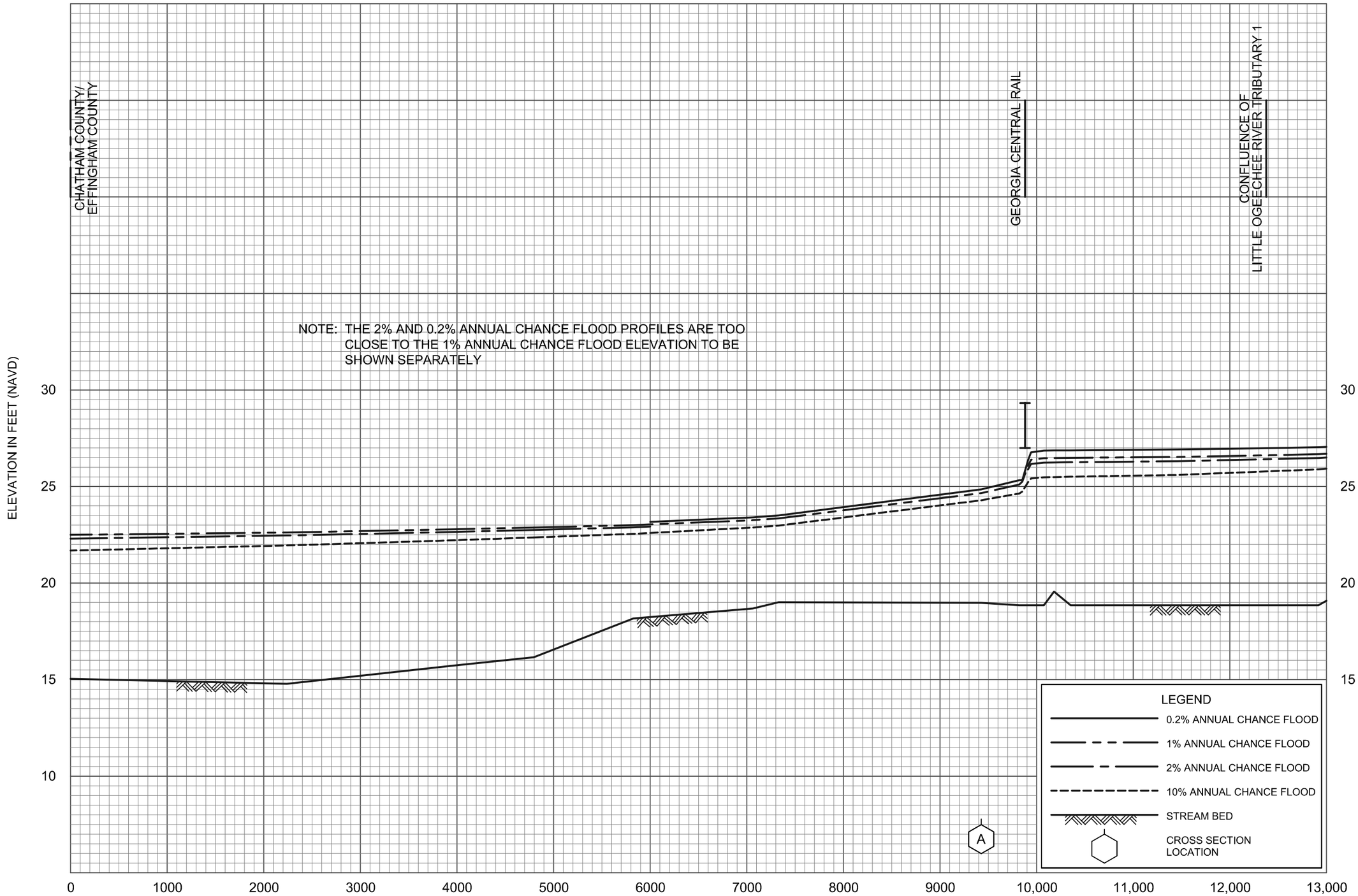
JACKS BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

09P



FLOOD PROFILES

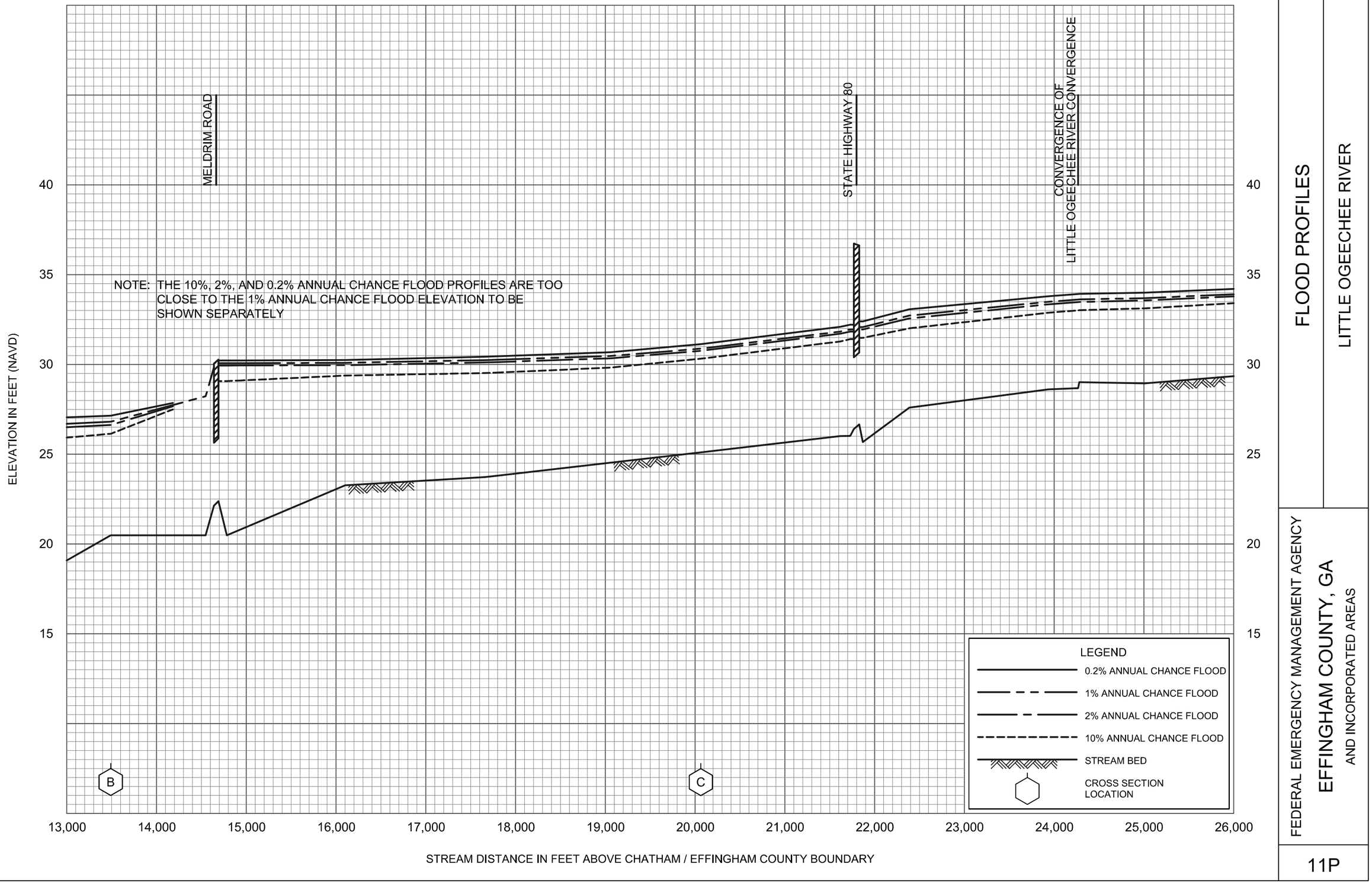
LITTLE OGEECHEE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

10P



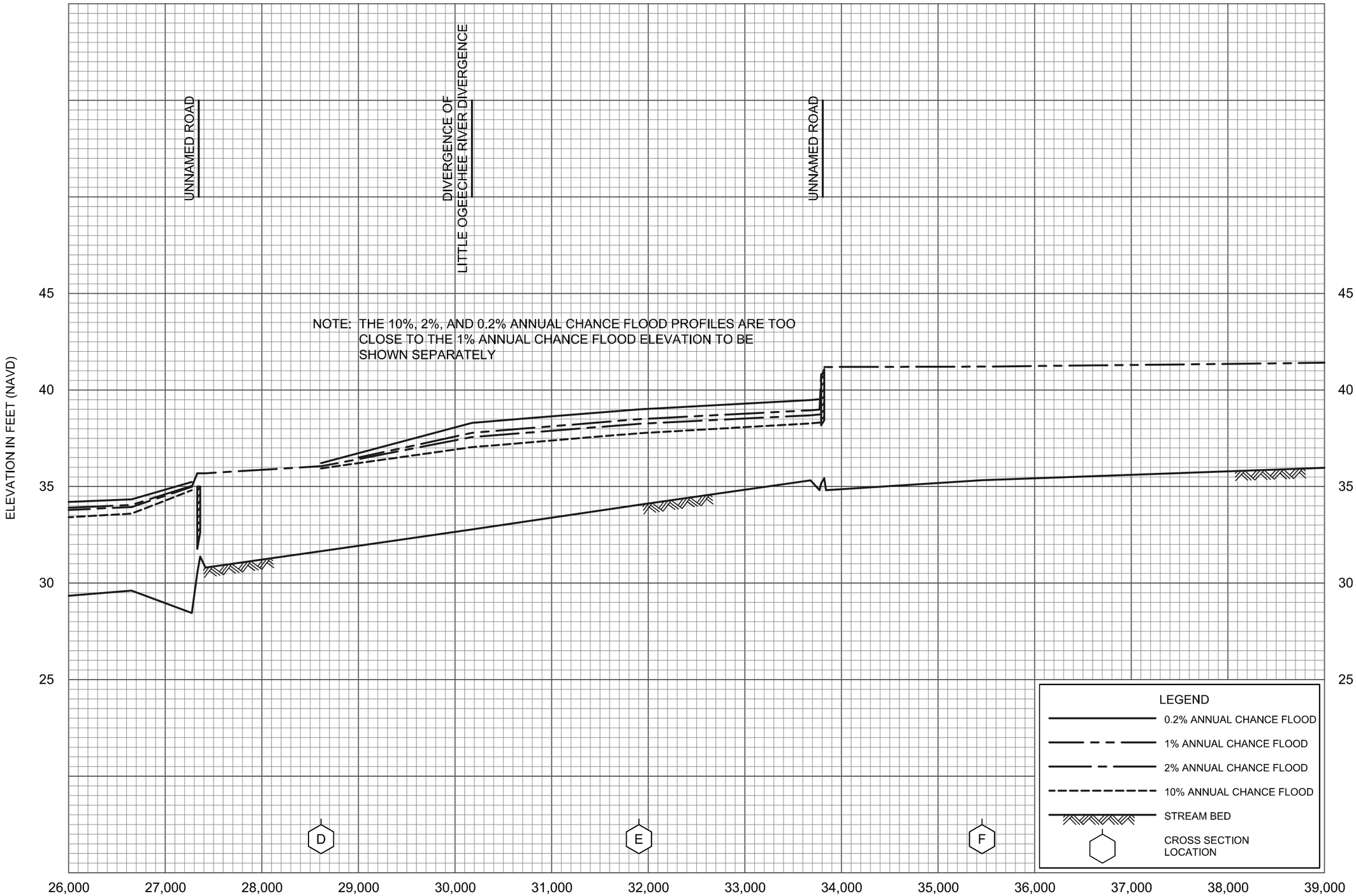
FLOOD PROFILES

LITTLE OGEECHEE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS



FLOOD PROFILES

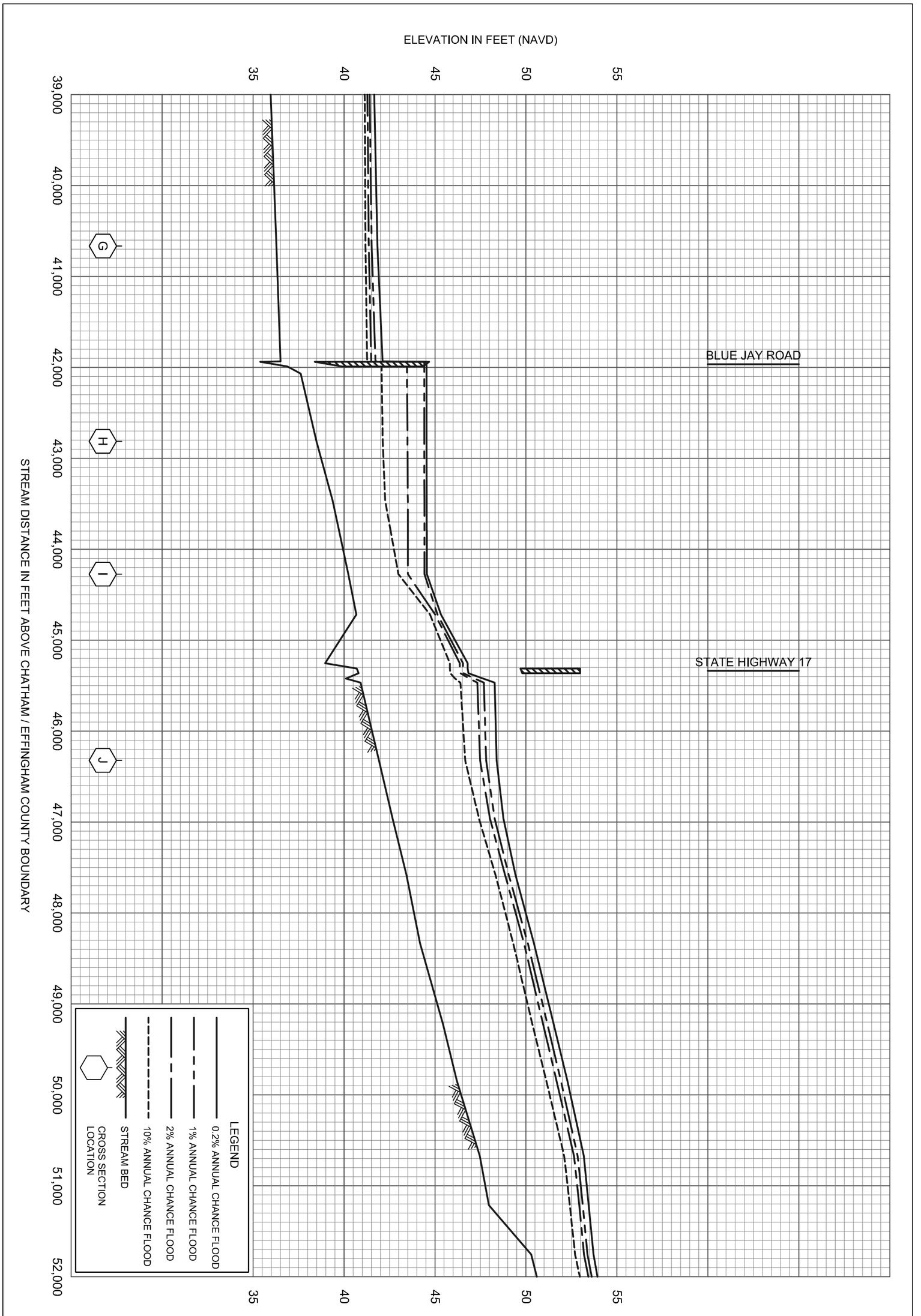
LITTLE OGEECHEE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

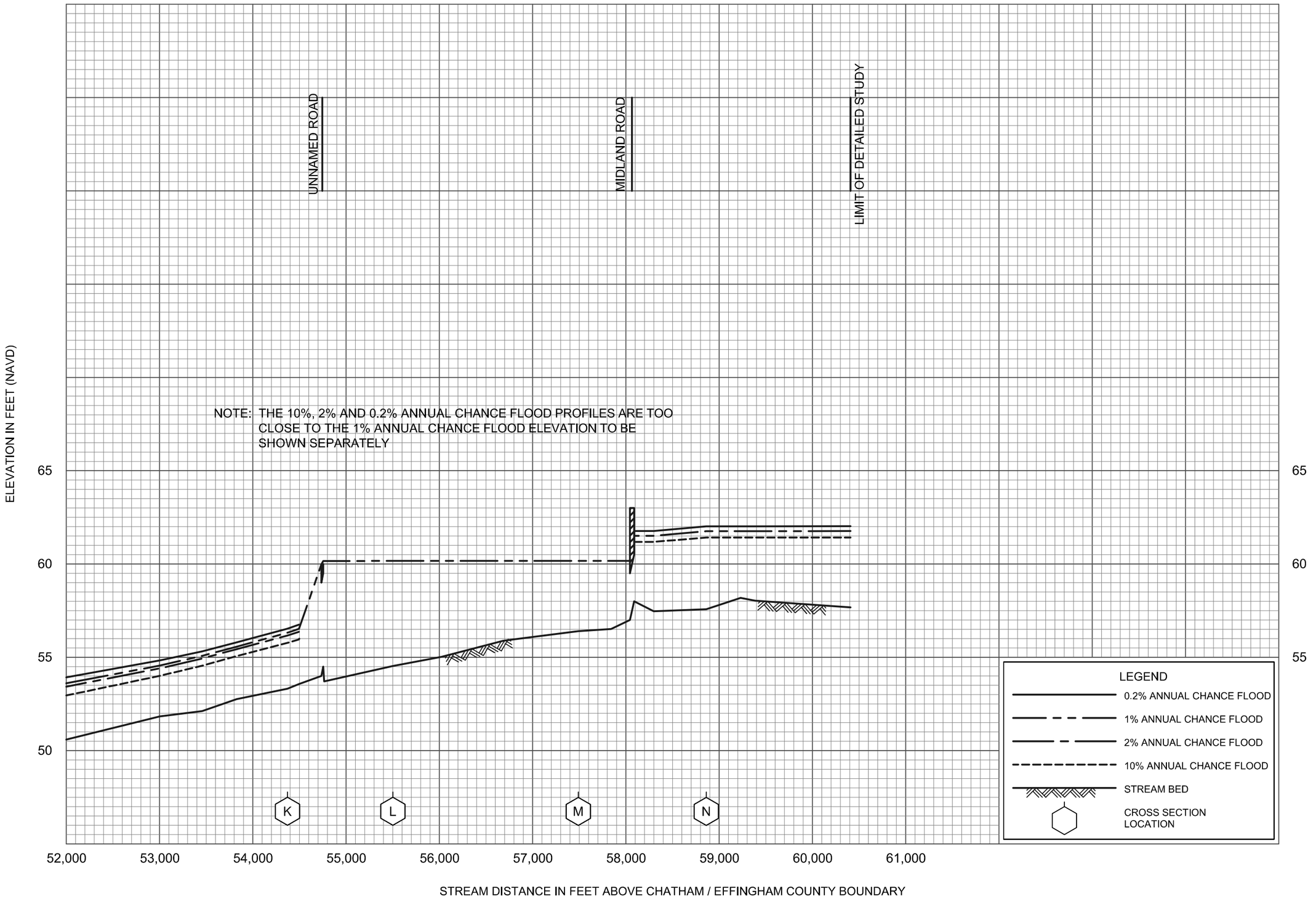
EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

12P



13P	FEDERAL EMERGENCY MANAGEMENT AGENCY EFFINGHAM COUNTY, GA AND INCORPORATED AREAS	FLOOD PROFILES LITTLE OGEECHEE RIVER



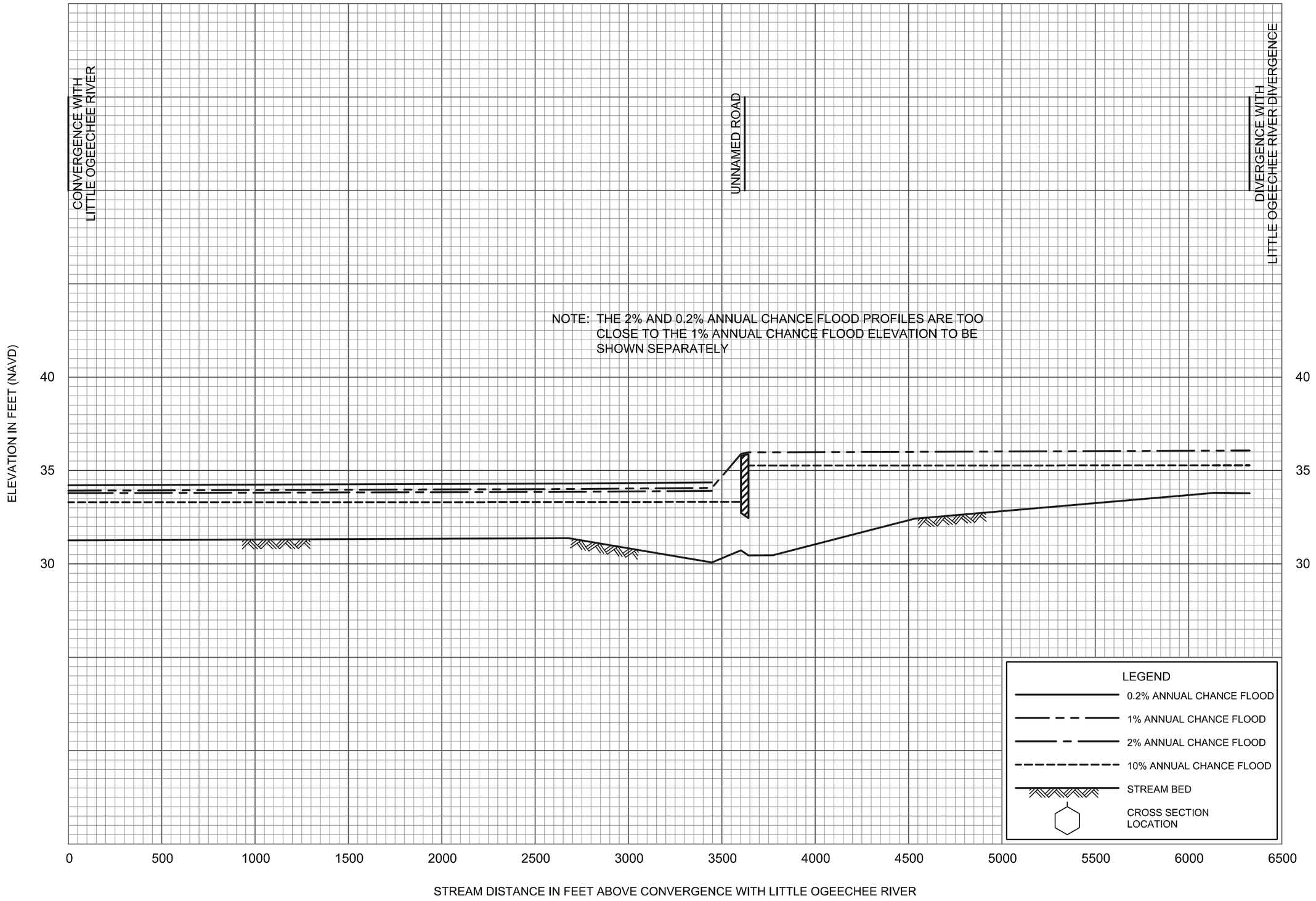
FLOOD PROFILES

LITTLE OGEECHEE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS



FLOOD PROFILES

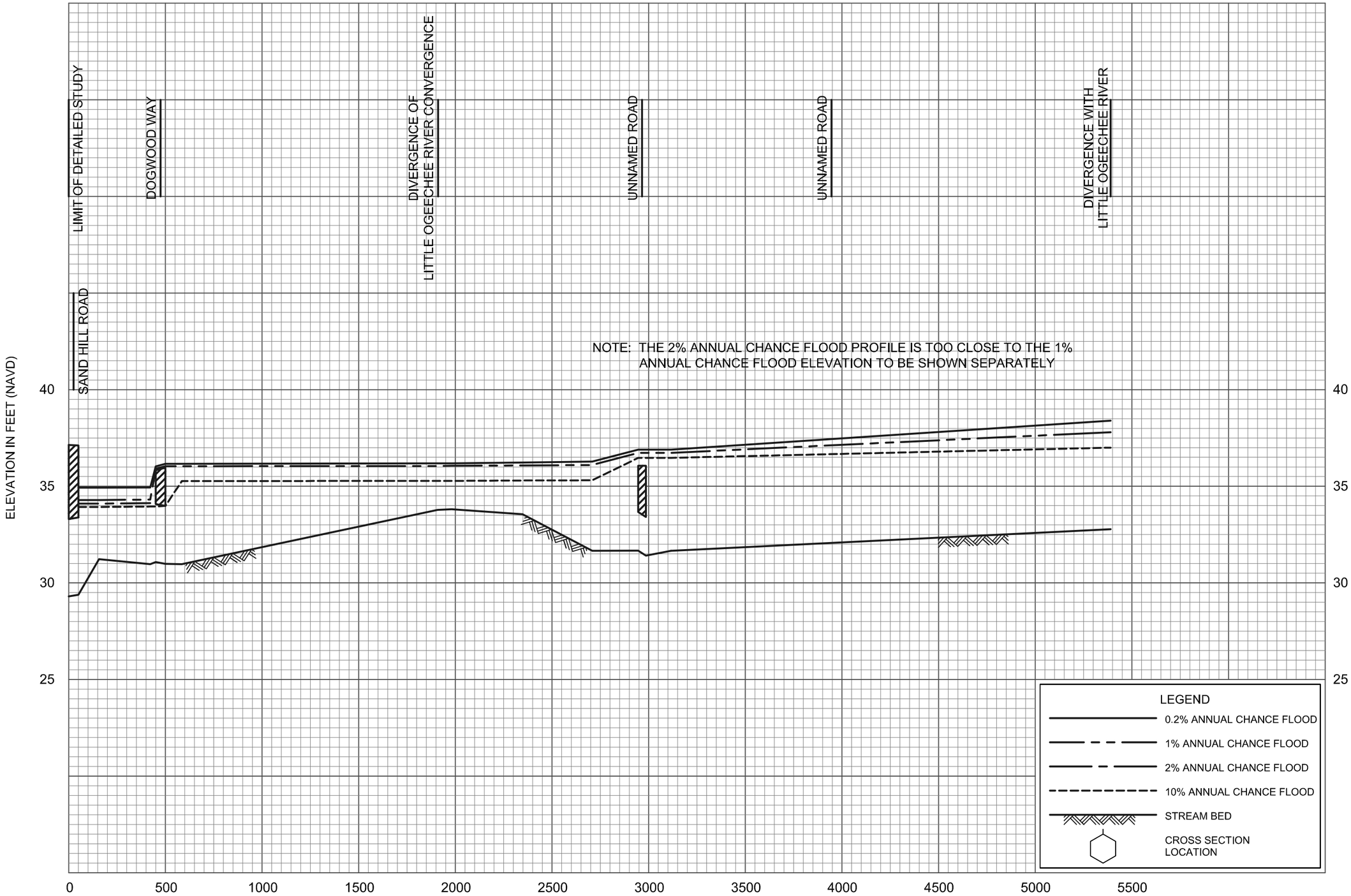
LITTLE OGEECHEE RIVER CONVERGENCE

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

15P



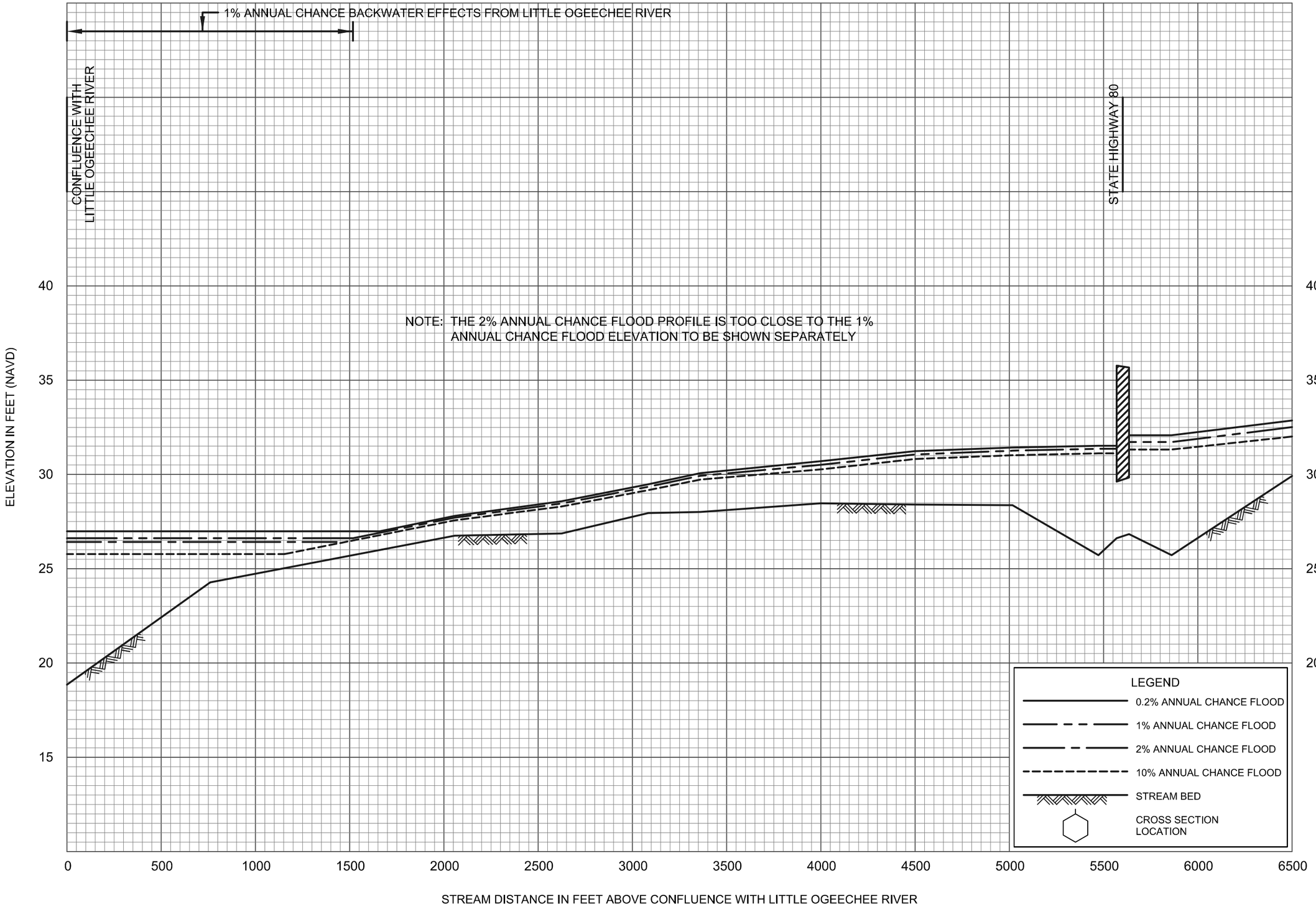
FLOOD PROFILES

LITTLE OGEECHEE RIVER DIVERGENCE

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS



FLOOD PROFILES

LITTLE OGEECHEE RIVER TRIBUTARY 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

17P

NOTE: THE 2% ANNUAL CHANCE FLOOD PROFILE IS TOO CLOSE TO THE 1% ANNUAL CHANCE FLOOD ELEVATION TO BE SHOWN SEPARATELY

ELEVATION IN FEET (NAVD)

40
35
30
25

6500 7000 7500 8000 8500 9000 9500 10,000 10,500 11,000 11,500 12,000 12,500

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH LITTLE OGEECHEE RIVER

LEGEND
- 0.2% ANNUAL CHANCE FLOOD
- 1% ANNUAL CHANCE FLOOD
- 2% ANNUAL CHANCE FLOOD
- 10% ANNUAL CHANCE FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD PROFILES

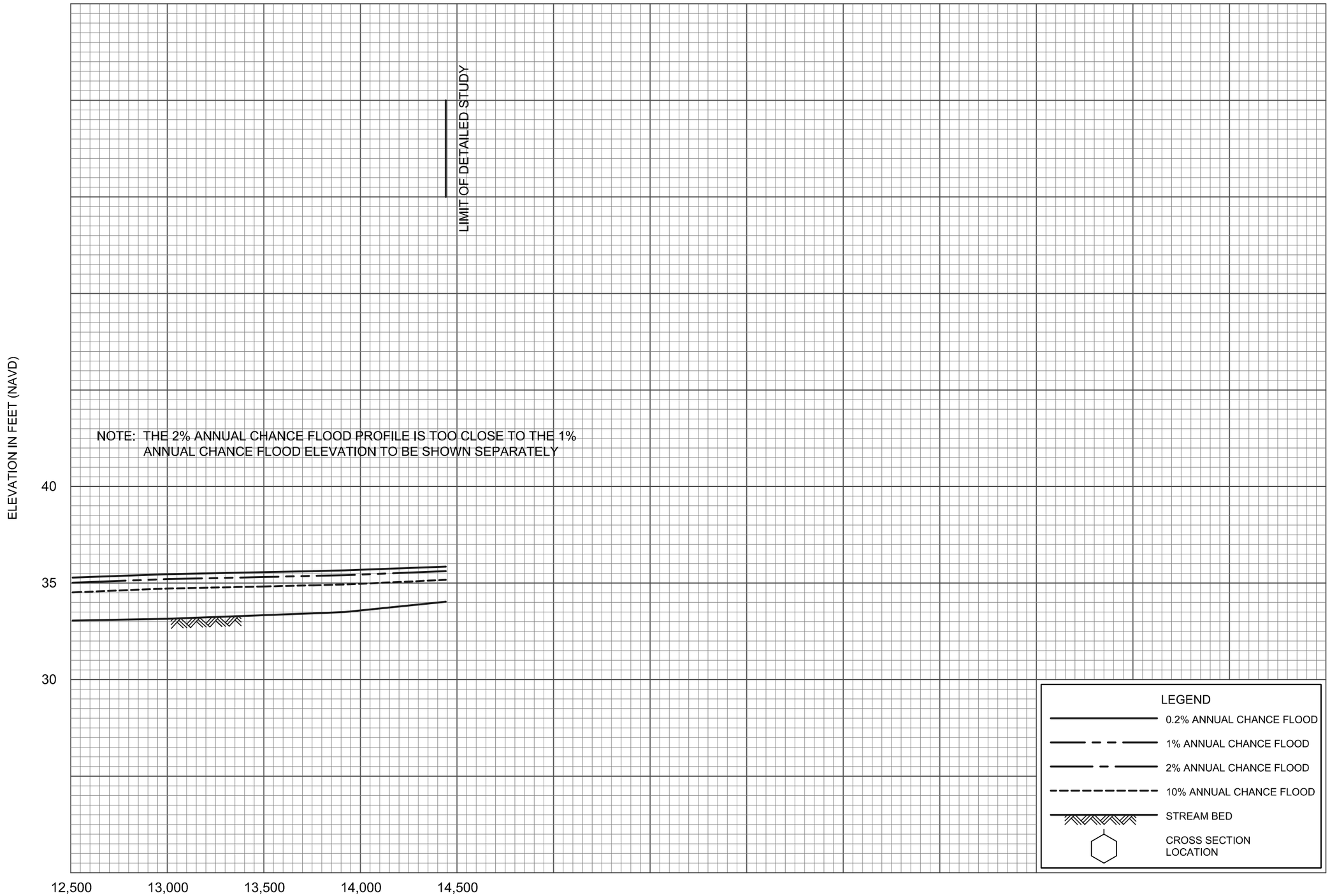
LITTLE OGEECHEE RIVER TRIBUTARY 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

18P



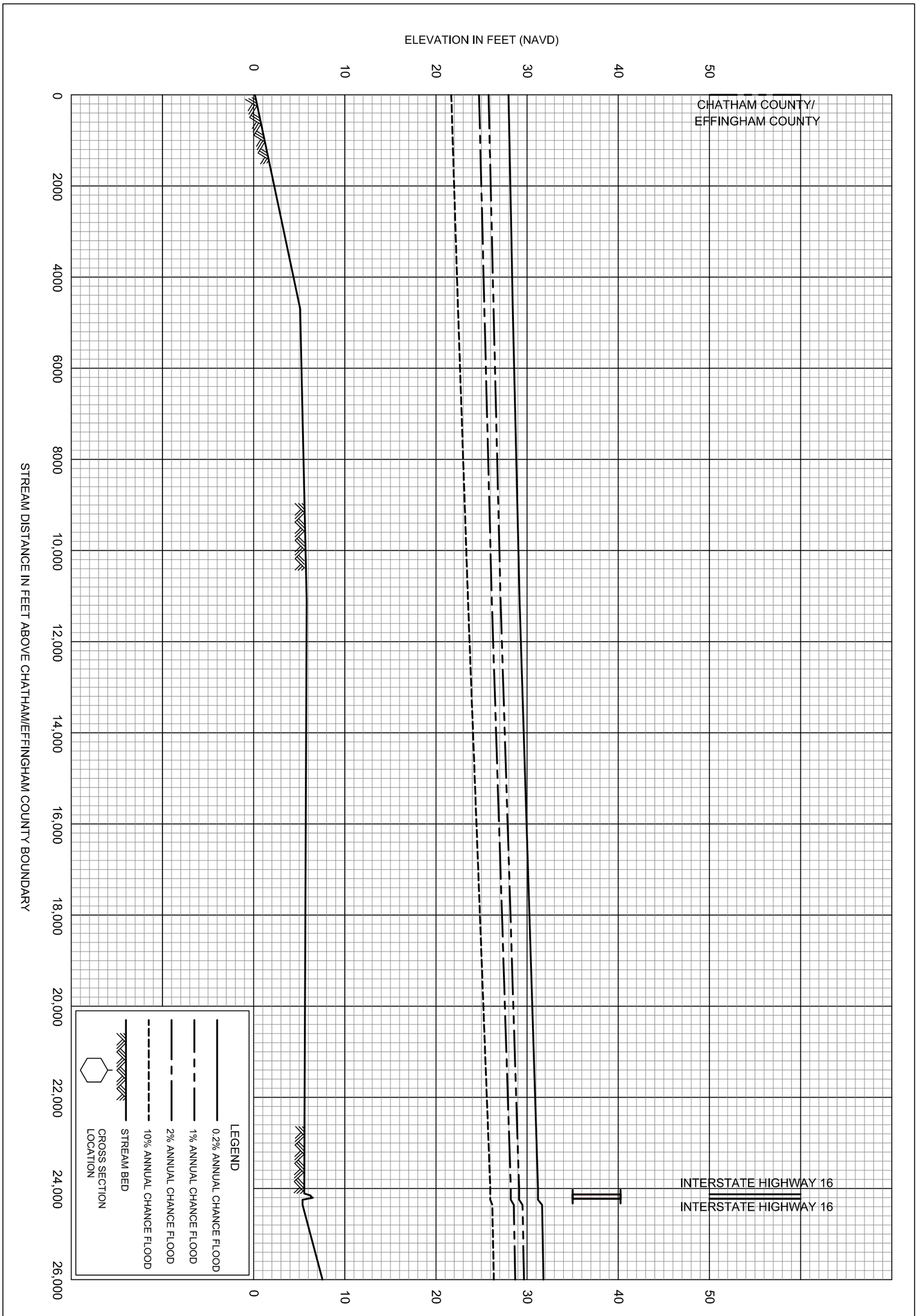
FLOOD PROFILES

LITTLE OGEECHEE RIVER TRIBUTARY 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS



20P

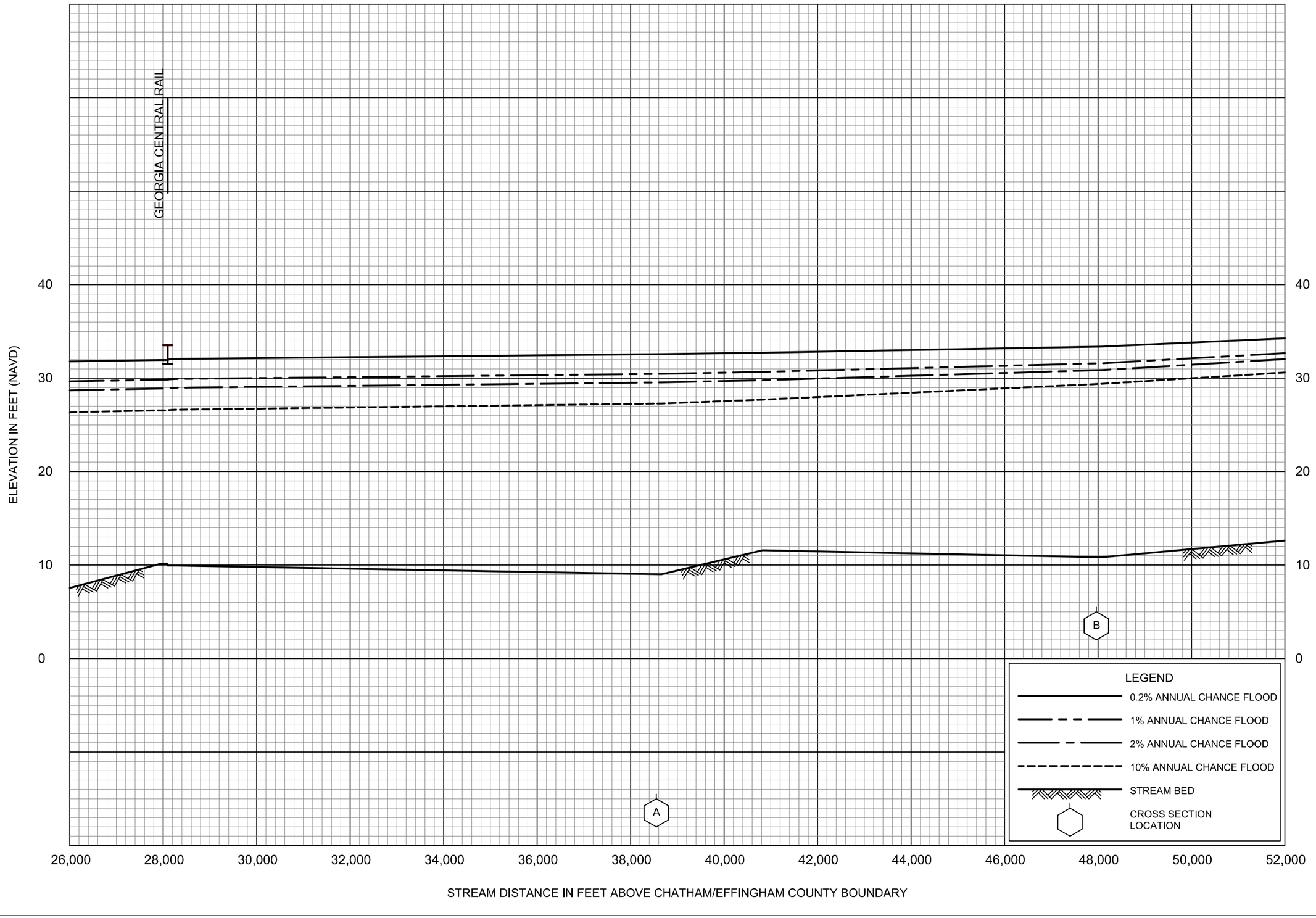
FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

FLOOD PROFILES

OGGECHEE RIVER



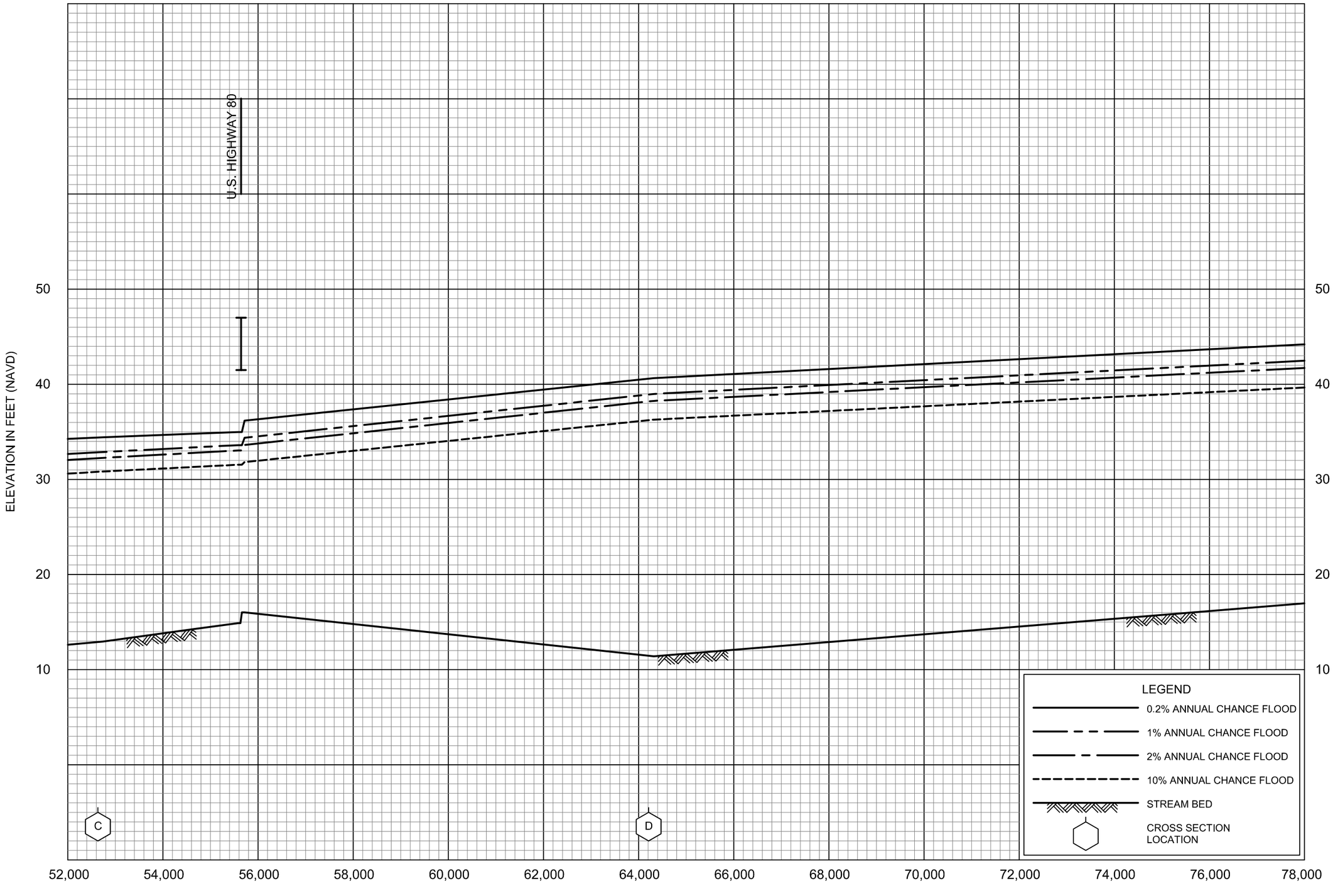
FLOOD PROFILES

OGEECHEE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS



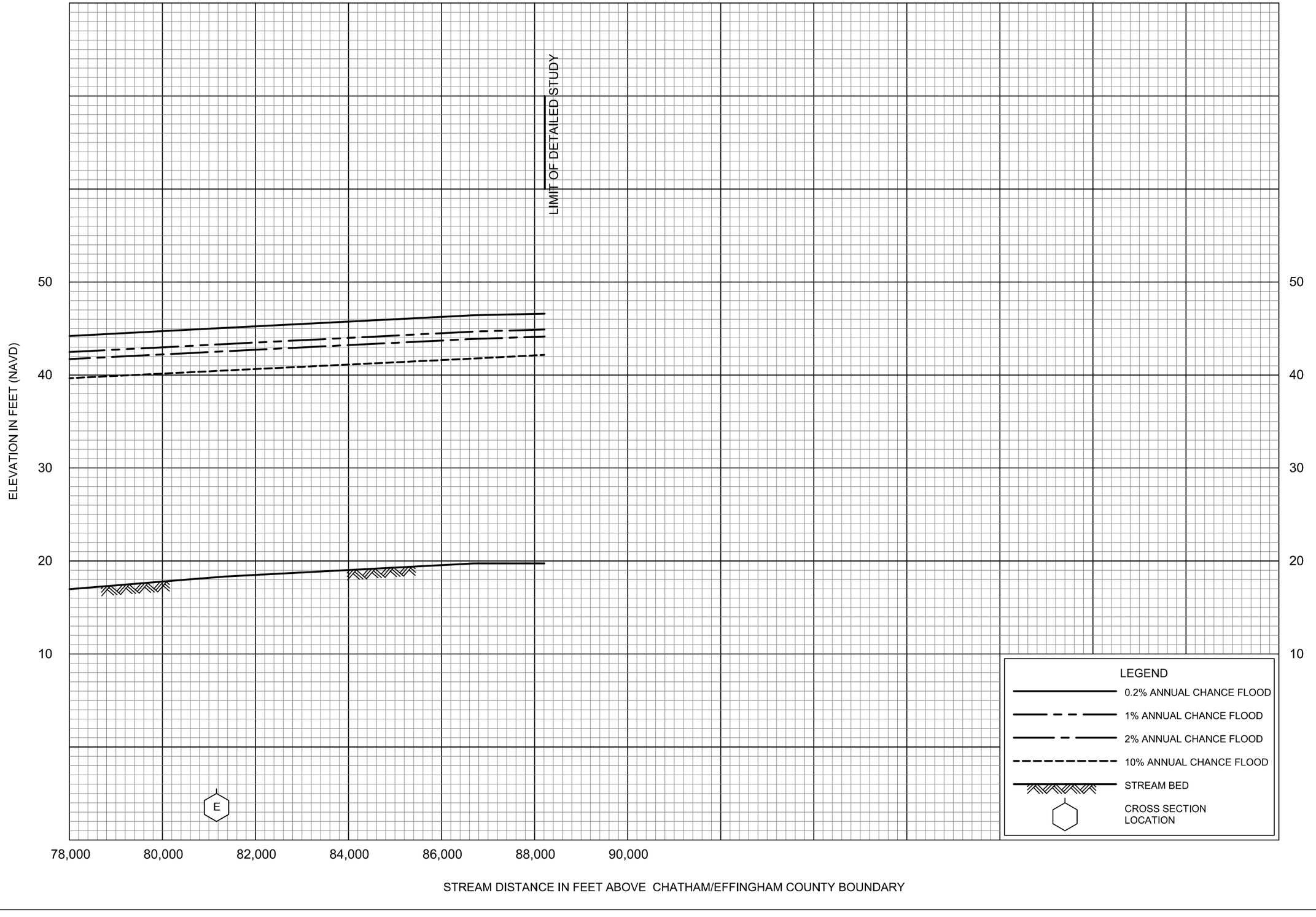
FLOOD PROFILES

OGEECHEE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS



FLOOD PROFILES

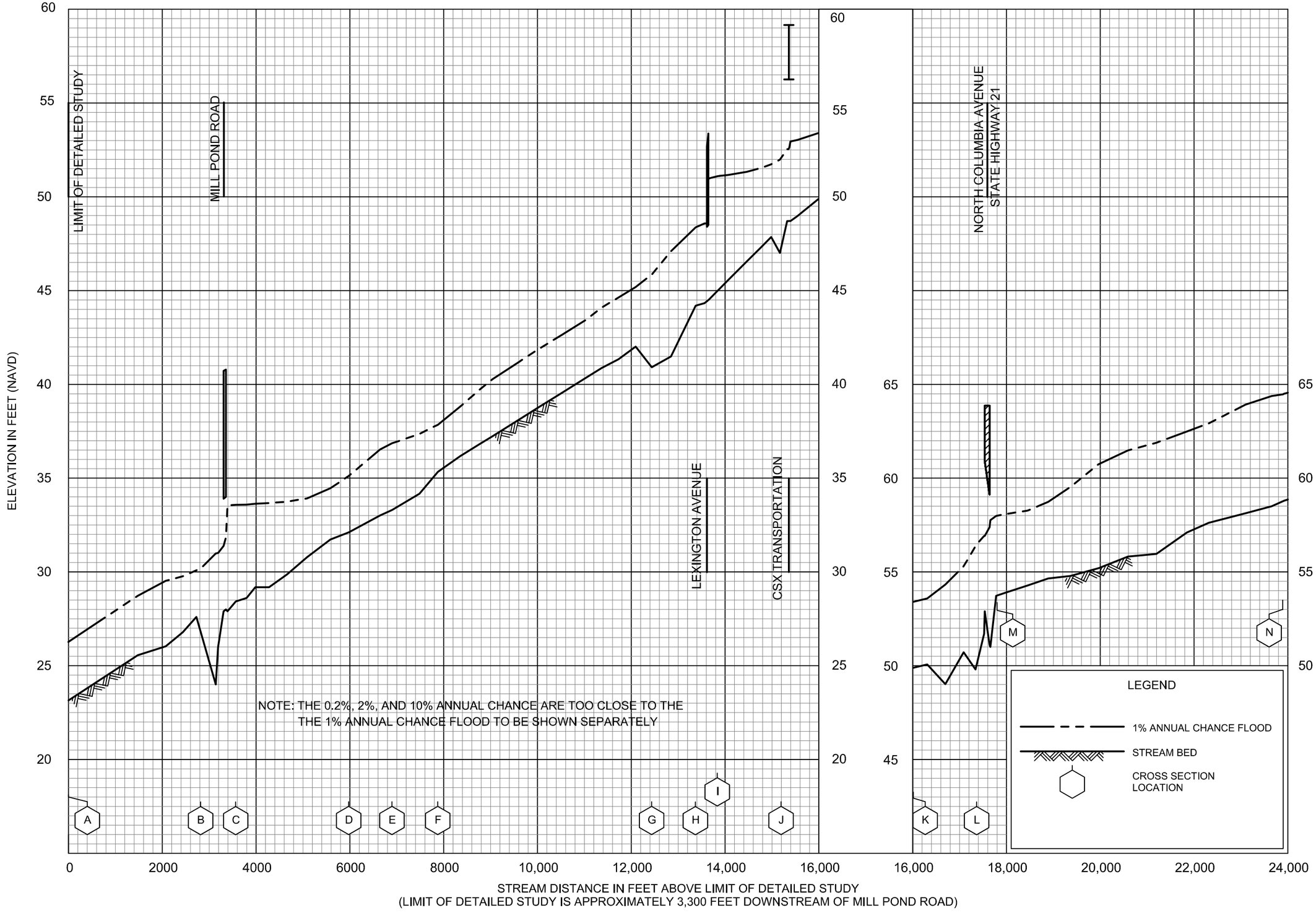
OGEECHEE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

23P



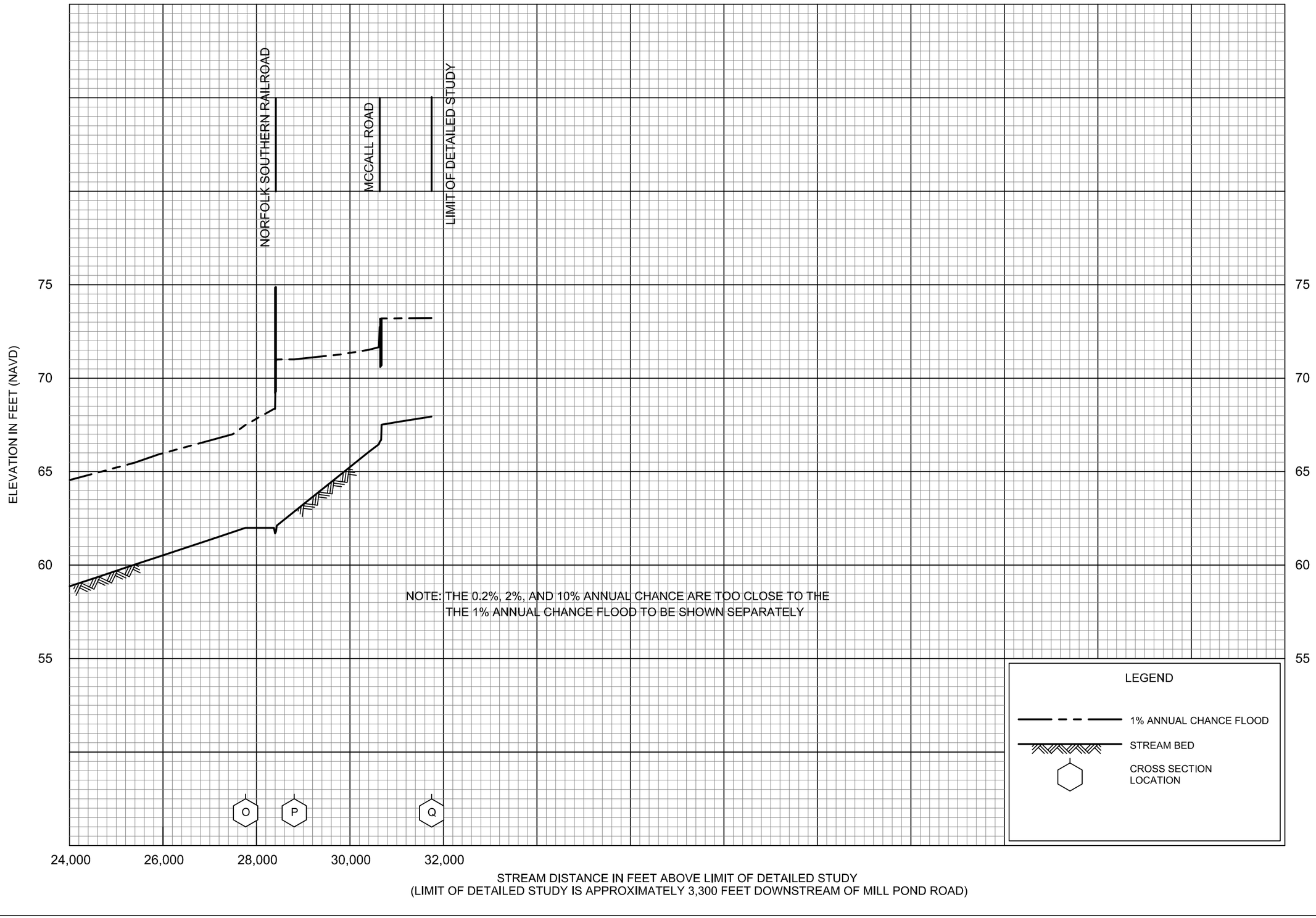
FLOOD PROFILES

POLLY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS



FLOOD PROFILES

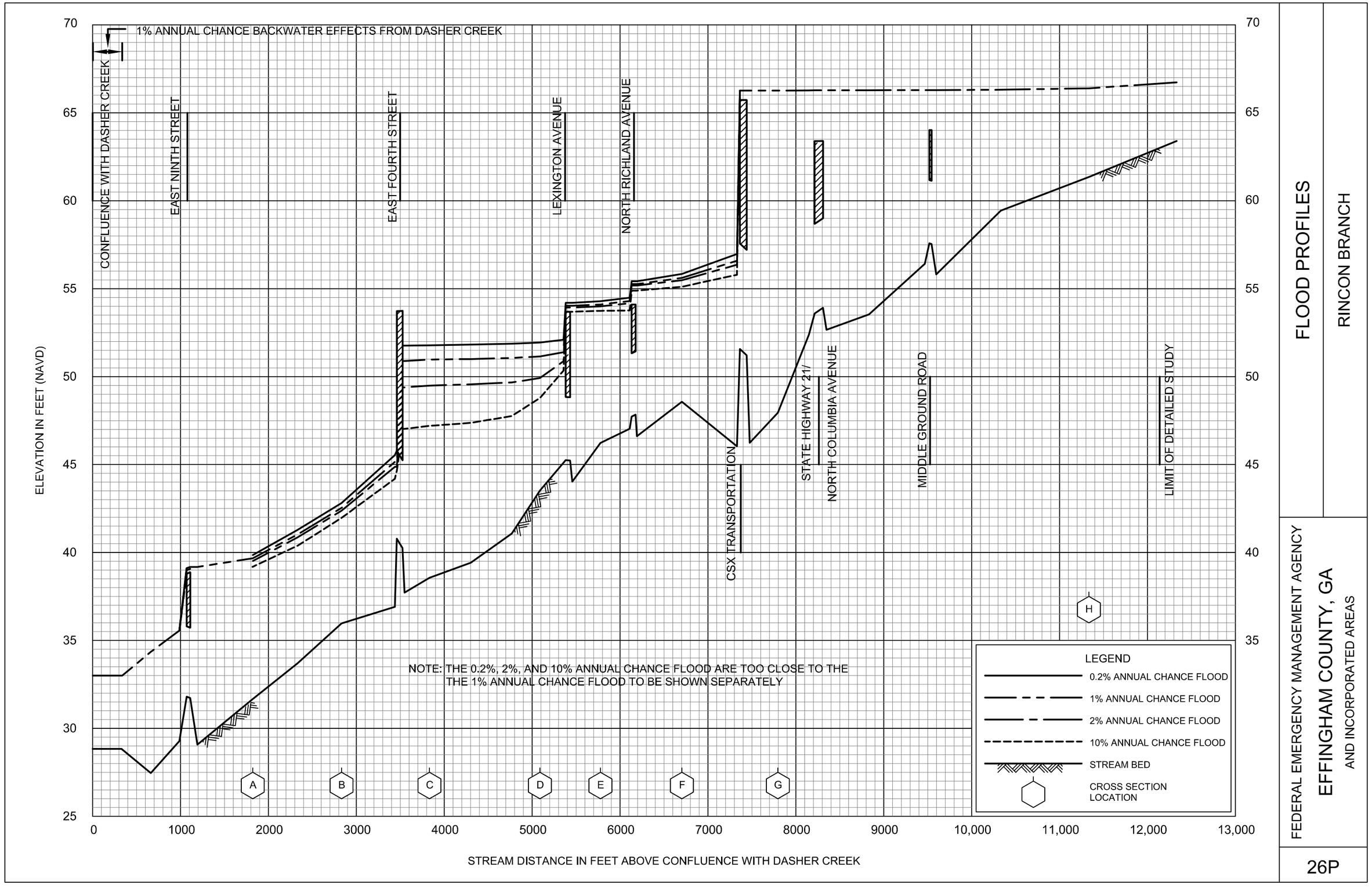
POLLY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

25P



FLOOD PROFILES

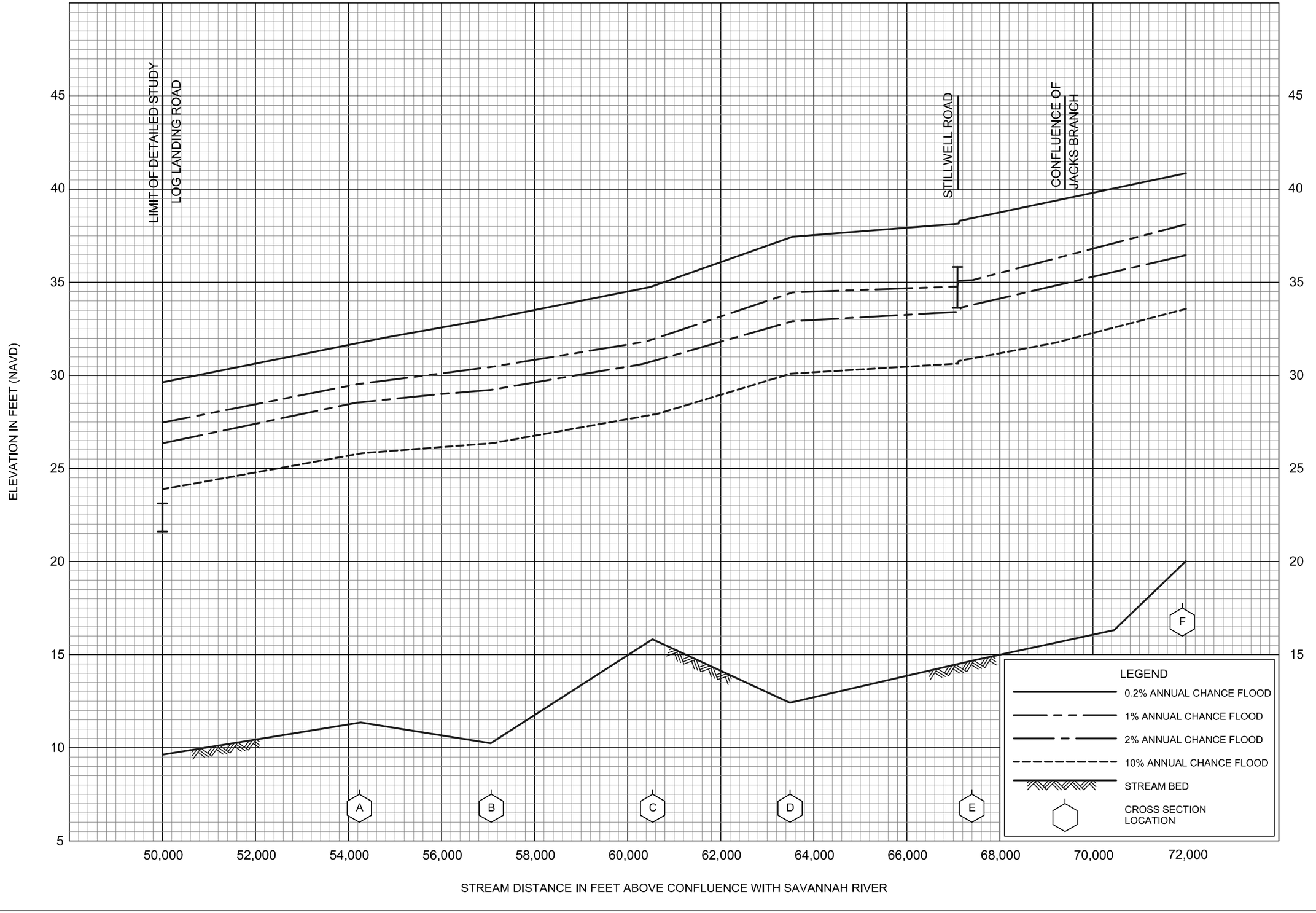
RINCON BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

26P



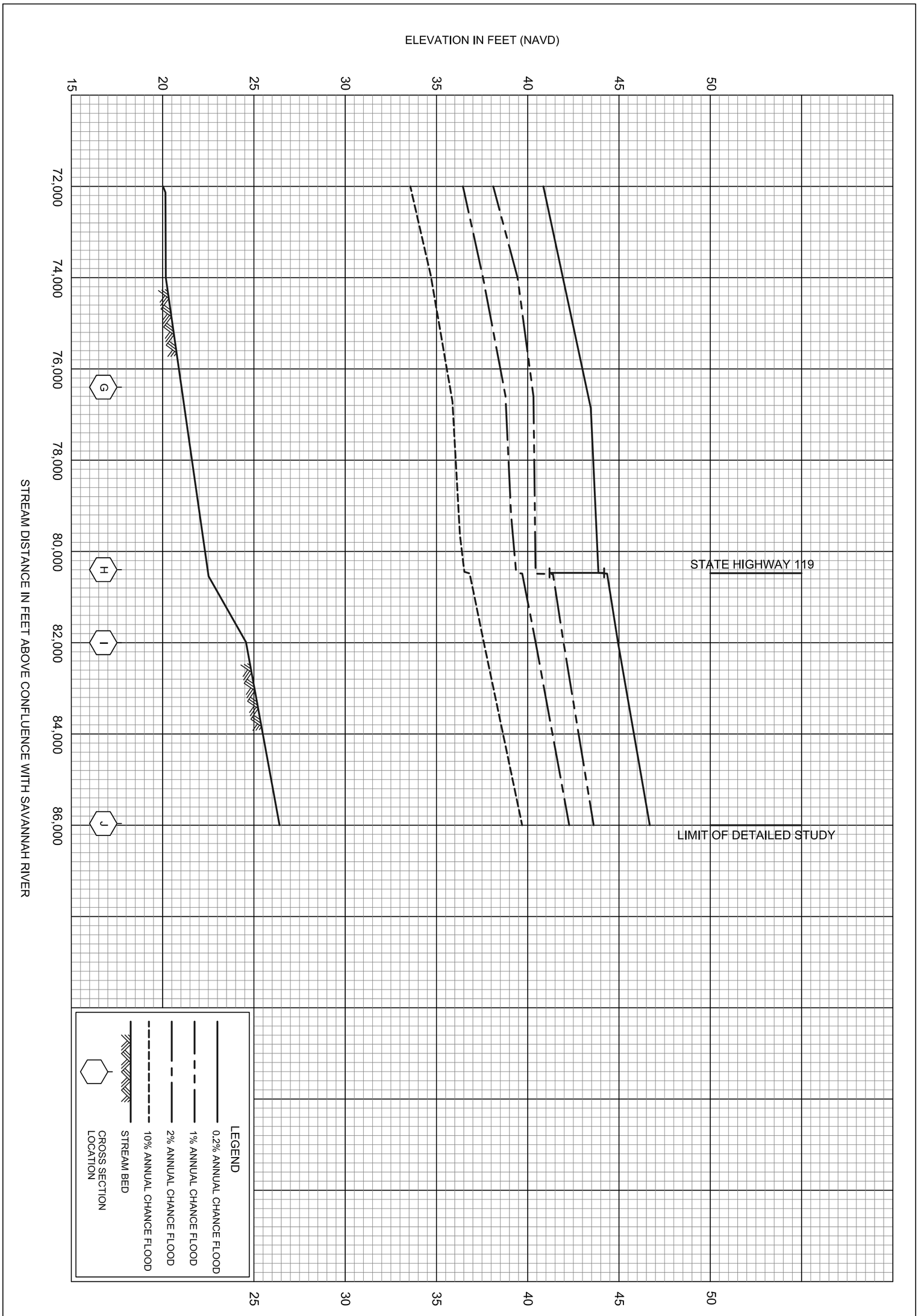
FLOOD PROFILES

RUNS BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS



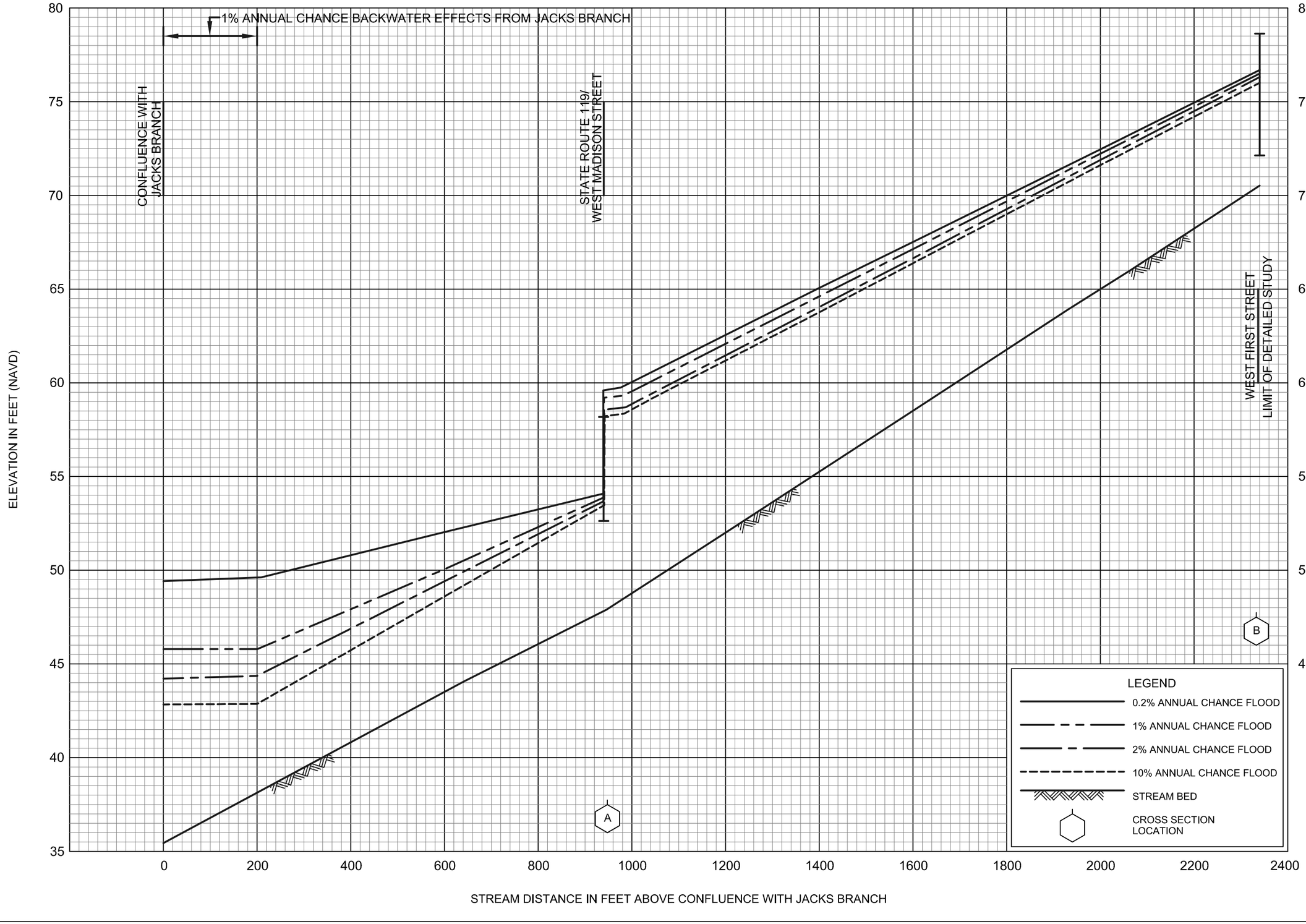
FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

FLOOD PROFILES

RUNS BRANCH



FLOOD PROFILES

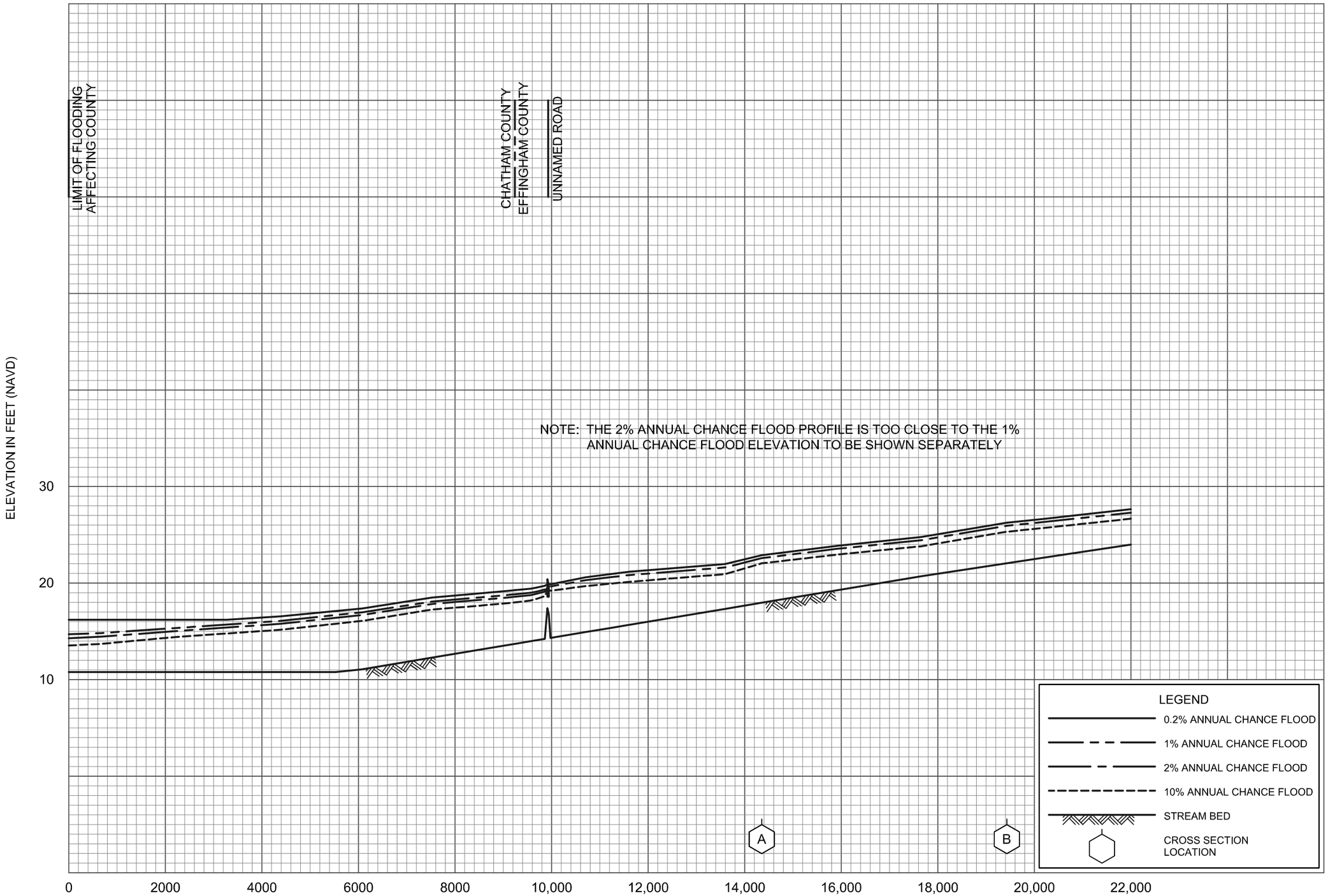
SNOOKS BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

29P



FLOOD PROFILES

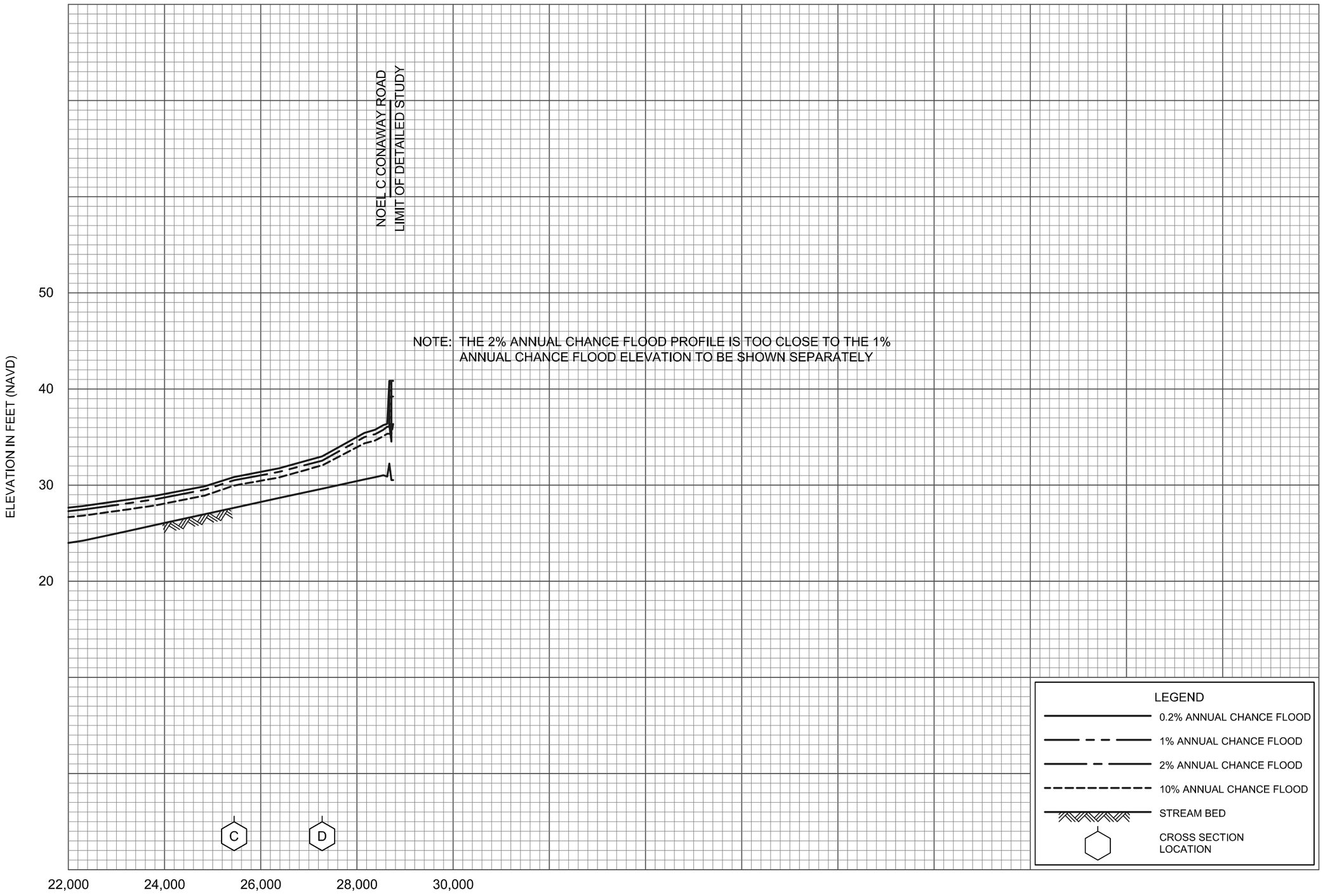
ST. AUGUSTINE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

30P



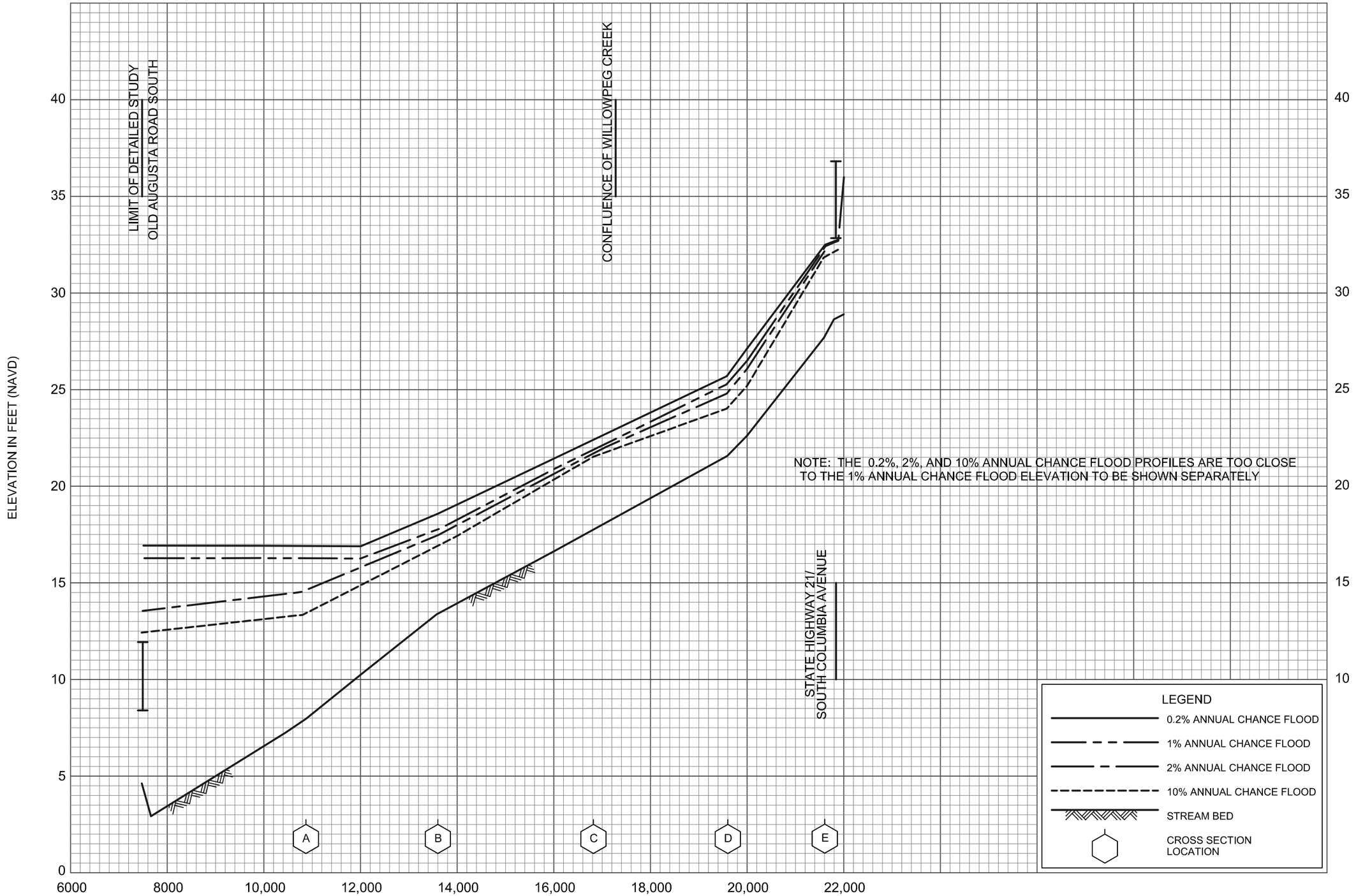
FLOOD PROFILES

ST. AUGUSTINE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS



FLOOD PROFILES

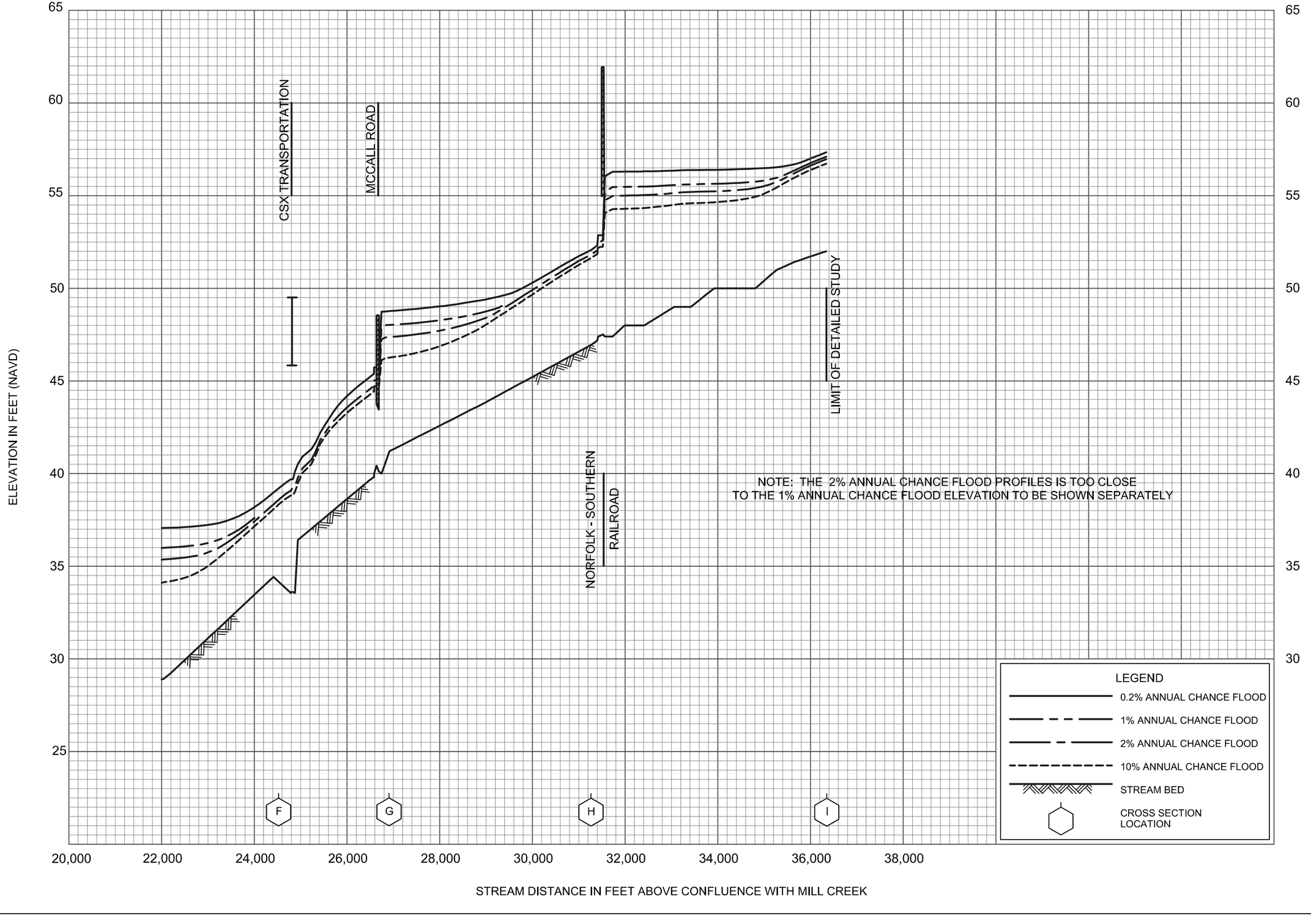
SWEIGOFFER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

32P



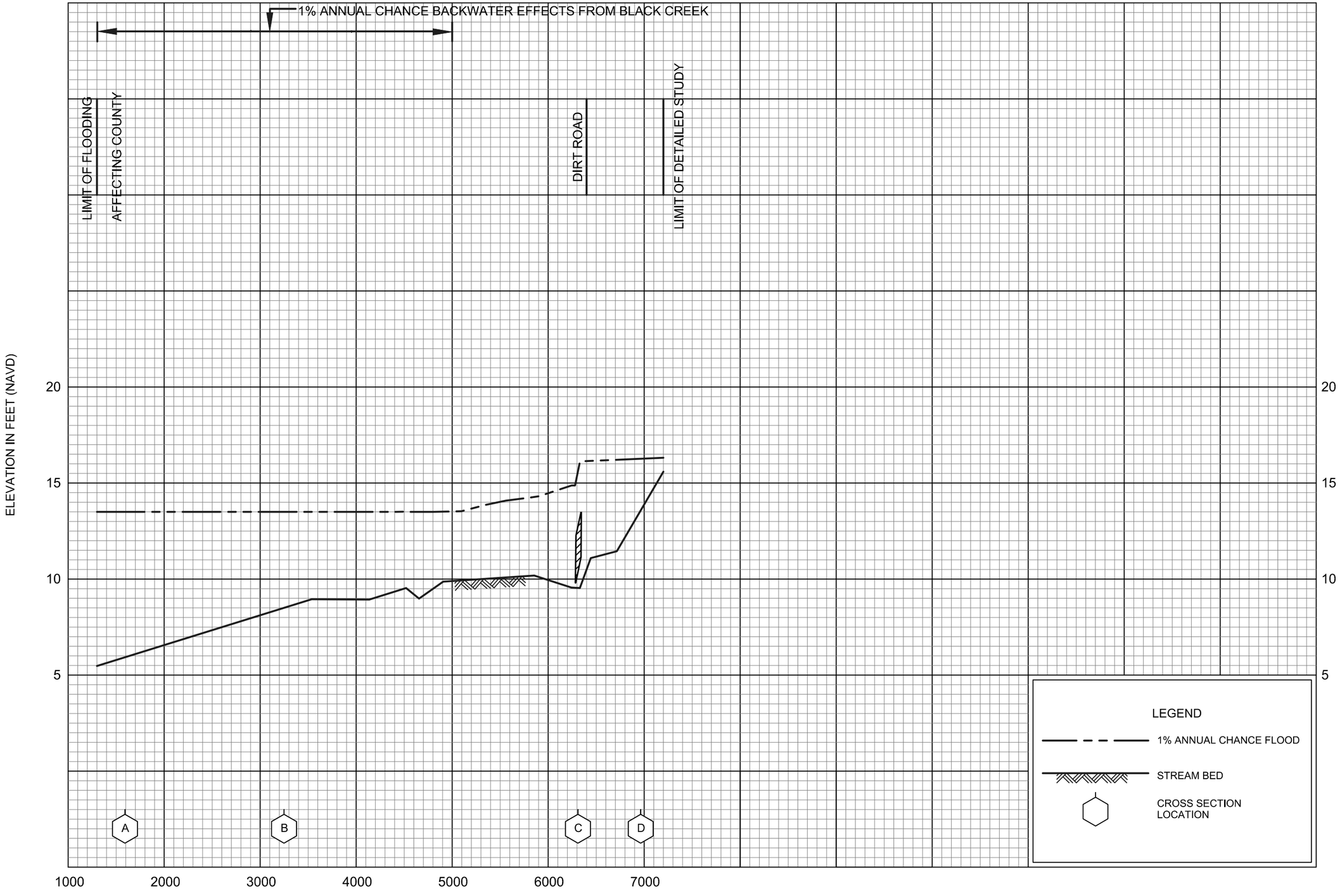
FLOOD PROFILES

SWEIGOFFER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS



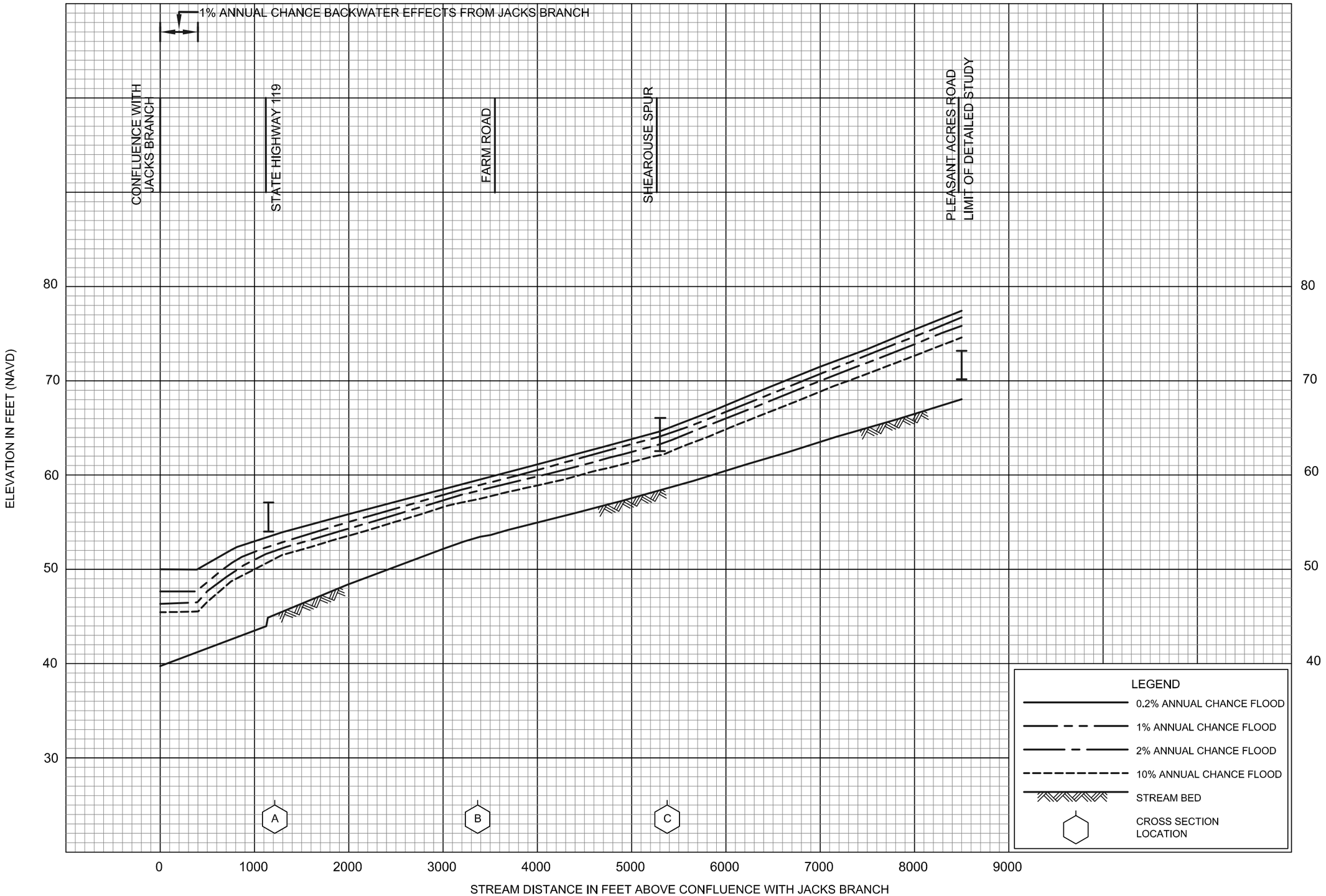
FLOOD PROFILES

UNNAMED TRIBUTARY TO BLACK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS



FLOOD PROFILES

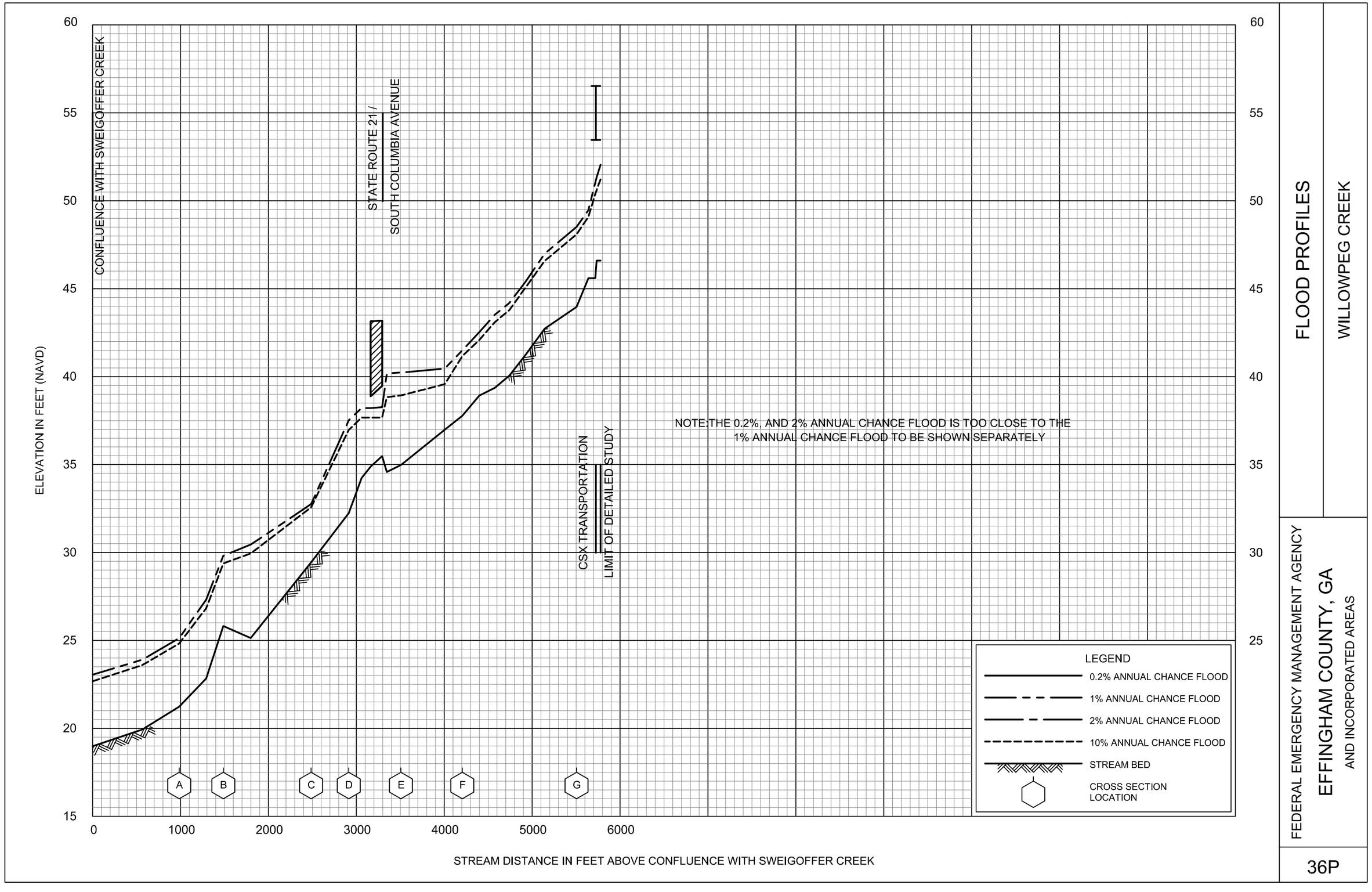
WHITE DEER BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

35P



FLOOD PROFILES

WILLOWPEG CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

EFFINGHAM COUNTY, GA

AND INCORPORATED AREAS

36P